ADVENTURES OF FUTURE SCIENCE

September

WONDER Stories

HUGO GERNSBACK
Editor

A GERNSBACK PUBLICATION

In This Issue

"THE DEATH OF IRON"
By S. S. Held

"IN MARTIAN DEPTHS"
By Henrik Dahl Juve

"AFTER ARMAGEDDON"
By Francis Flagg

"CROSSROADS OF SPACE"
By Arthur G. Stangland

25¢

STELLAR PUBLISHING CORPORATION
96-98 Park Place, New York, N. Y.

WS-732

I am enclosing herewith my remittance of $..... for which you are to send me the numbers of books in the SCIENCE FICTION SERIES which I have circled below, at the price of 5c each or Six Books for Twenty-five Cents. No less than three books sold. Send remittance in check, stamps or money order.

2 6 8 10 12

5 7 9 11

Name.....

Address.....

City.....

State.....

FOR A BIG SAVING, CLIP AND MAIL COUPON

6 New Titles HAVE BEEN ADDED TO THE SCIENCE FICTION SERIES

FULL DETAILS WILL BE FOUND ON PAGE 384

There still remains many titles from the original printing of the first twelve books, but the supply is fast diminishing. Once the supply is exhausted they will not be reprinted again.

Titles from the first printing can now be bought at FIVE CENTS each. To take advantage of this offer, the coupon at the upper left MUST be used.

The following are the old titles; order by number.

2—THE THOUGHT PROJECTOR
By David H. Keller, M.D.

The power of suggestion on the human mind forms the basis of "The Thought Projector." Ideas repeated over and over exert a great force on us. They penetrate our minds and give us ideas that we often think are our own.

5—THE BRAIN OF THE PLANET
By Lillith Lorraine

If a super-intelligence could have its wisdom poured into our brains, what a different world we might have. Miss Lorraine poses such a problem and works out the answer in an astounding manner.

6—WHEN THE MOON FELL
By Charles H. Colladay

Collisions between celestial bodies of any size have not occurred within historical times. But such an event is not an impossibility. In fact many astronomers believe that our solar system came into being by such a collision. Suppose the moon were to crash into the earth. What would happen?

7—THE MECHANICAL MAN
By Amelia Reynolds Long

The age of the robot is just dawning and some of its infinite possibilities. Miss Long dips into it in this thrilling story.

THE THOUGHT STEALER
(Second Part—Book 7)
By Frank Bourne

That it may be possible, sometime in the future, for a brilliant scientist to penetrate the minds of others and examine their thoughts, is the theme of this engrossing story.

8—THE TORCH OF RA
By Jack Bradley

All about us lies a tremendous amount of untouched power; in the sun, in the cosmic rays, etc. This power, if obtained and concentrated, might be put to great use.

9—THE VALLEY OF THE GREAT RAY
By Pansey E. Black

We know very little about the real potentialities of matter. There may be great civilizations that have found and utilized these potentialities far beyond our own conception.

10—THE ELIXIR
By H. W. Higginson

Brain power is often dependent on the influences of our glands. By proper stimulation of some kind, it may be possible in the future to produce great geniuses.

11—THE THOUGHT TRANSLATOR
By Merab Eberle

Mental telepathy is becoming generally accepted as an accomplished fact. Some of its uses, especially by mechanical means, may be very tragic or very amusing.

THE CREATION
(Second Part—Book 11)
By M. Milton Mitchell

It should be possible in the future to create living beings synthetically, and when this is done, there will be some amazing results.

12—THE LIFE VAPOR
By Clyde Farrar

Mr. Farrar is evidently an expert in his subject. He shows how, by proper control, it may be possible to change the entire course of human life.

THRTY MILES DOWN
(Second Part—Book 12)
By D. D. Sharp

What lies far beneath the surface of the earth, still remains quite a mystery to us. Mr. Sharp has erected a rather amazing theory.

BIG BARGAIN OFFER!

EACH BOOK

5c

To quickly close out our supply of old titles, each book can now be bought for Five Cents—

Coupon must accompany order to make it valid.

Not Less Than Three Books Sold

WIN FAME and FORTUNE in RADIO!

Don't spend your life slaving away in some dull, hopeless job! Don't be satisfied to work for a mere $20 or $30 a week. Let me show you how to make money in Radio—the fastest-growing, biggest field on earth!

JOBS LEADING TO SALARIES OF $50 A WEEK AND UP!

Jobs as Designer, Inspector and Tester—as Radio Salesman and in Service and Installation Work—as operator or Manager of a Broadcasting Station—as Wireless Operator on a Ship or Airplane, as a Talking Picture or Sound Expert—HUNDREDS of OPPORTUNITIES for fascinating, well-paid Jobs!

10 Weeks of Shop Training At Coyne in Chicago

You are given a thorough training in Radio at Coyne—**in 10 short, pleasant weeks** by actual work on real Radio, Television and Sound equipment. We don't waste time on useless theory. We give you the **practical training you will need.**

All Practical Work at Coyne

You are not trained by book study at Coyne. We train you on a great outlay of Radio, Television and Sound equipment—on scores of modern Radio Receivers, huge Broadcasting equipment, the very latest Television apparatus, Talking Picture and Sound Reproduction equipment, Code Practice equipment, etc. You don't need advanced education or previous experience. We give you—**right here in the Coyne Shops**—the actual practice and experience you'll need.

TELEVISION
Is Now Here!

And TELEVISION is already here! Soon there'll be a demand for THOUSANDS of TELEVISION EXPERTS! The man who learns Television NOW can have a real future in this great new field. Get in on the ground-floor of this amazing new Radio development! Learn Television at COYNE on the very latest, newest Television equipment.

Talking Pictures
A Great Field

Talking Pictures and Public Address Systems offer thousands of golden opportunities to the Trained Radio man. Here is a great new field of Radio that has just started to grow! Prepare NOW for these marvelous opportunities! Learn Radio Sound Work at Coyne, on actual Talking Picture and Sound Reproduction equipment.

Coyne is 32 Years Old

You get Free Employment Help as long as you live. And if you need part-time work while at school to help pay expenses we'll gladly do all we can to get it for you if you will tell us your problems. Coyne is 32 years old! Coyne training is tested—proven beyond all doubt. You can find out everything ABSOLUTELY FREE. JUST MAIL COUPON FOR MY BIG FREE BOOK, telling all about jobs—salaries—opportunities. Mail the coupon—NOW!

H. C. LEWIS, President
Radio Division, Coyne Electrical School
500 S. Paulina St., Dept. 62-2M Chicago, Ill.

Dear Mr. Lewis:—
Send me your Big Free Radio Book and all details of your Special Offer.

Name.....

Address.....

City.....*State*.....

H. C. Lewis, Pres. ***Radio Division*** Founded 1899

Coyne Electrical School

500 S. Paulina Street Dept. 62-2M Chicago, Illinois

The Magazine of Prophetic Fiction

WONDER Stories

CONTENTS FOR SEPTEMBER, 1932

THE DEATH OF IRON
(In Three Parts — Part One)
by S. S. Held ..... Page 294
Like a deadly contagion came the siderosis, to decay all metals ....

CROSSROADS OF SPACE
by Arthur G. Stangland ..... Page 310
Adrift in the great unknown, they fought off certain death ....

IN MARTIAN DEPTHS
by Henrik Dahl Juve ..... Page 320
Horrors stalked them on every side, as they fought their way through the hostile planet ....

AFTER ARMAGEDDON
by Francis Flagg ..... Page 340
After chaos came the dawn of a new era—a new life ....

RED FLAME OF VENUS
by P. Schuyler Miller ..... Page 346
Into the temple of his enemy he went, seeking the secret of the Flame Orchid ....

IN THE YEAR 8000
by Otfrid von Hanstein ..... Page 360
(In Three Parts — Part Three)
One of two men could be saved, the man of brain or the man of emotion ....

SCIENCE QUESTIONS AND ANSWERS ..... Page 376

THE READER SPEAKS—
Letters from Readers ..... Page 378

WHAT IS YOUR SCIENCE KNOWLEDGE? ..... Page 382

ON THE COVER THIS MONTH

we see another of Paul's scientific mysteries for our readers to puzzle out. Full directions for this contest, repeating that of the July issue, are found on Page 319. Again we offer a mental exercise and a test of imagination and scientific ingenuity to our readers with cash prizes as the reward.

NEXT MONTH

The Planet of Youth
by STANTON A. COBLENTZ

is a distinctly original story written in the realistic, satirical, and vivid style of that popular author. With the remembrance of the "Florida Boom" of 1925-26 fresh in our minds, we know how the human race swallows so easily the bait of perpetual health and great riches, thrown out by unscrupulous men. Suppose that a planet were discovered that yielded both of those sought-for things? What would happen on our poor little earth? The answer is given here with a surprising ending that will leave you breathless.

Chicago, 2042 A. D.
by PAUL BOLTON

is this new author's answer to the challenge of the gangster. The author is a newspaper man and has been close to the rise of racketeering and what it signifies. What will happen if the racketeer remains unchallenged and digs his fingers deeper and deeper into our lives? If racketeering continues to grow and prosper WHAT WILL HAPPEN ONE HUNDRED YEARS HENCE? "Chicago, 2042 A.D." is the answer.

Outcasts of Mars
by ARTHUR G. STANGLAND

carries on this versatile author's exciting stories of the far reaches of the solar system. Suppose a race of people were disinherited from their world and forced to seek refuge on another world? And suppose on that other world they were treated as outcasts and denied even a bare living? What would they do? Would they calmly accept it, or would an explosion occur that would reach across space to other worlds? Mr. Stangland's story gives one unusual possibility.

The Death of Iron
by S. S. HELD

grows in power as we see the ravages of *siderosis* sweep across France. We have just begun to perceive what would occur to civilization should our metals fail us. Now M. Held with vivid strokes draws his pictures more and more and more finely. We see how the disease of metals effects all parts of the population, and the new civil wars that will arise for control of the decaying civilization. The story rises and rises in power as this installment sweeps along.

Published by STELLAR PUBLISHING CORPORATION, H. GERNSBACK, Pres., S. GERNSBACK, Treas., I. S. MANHEIMER, Sec'y.
Publication Office, 404 North Wesley Avenue, Mount Morris, Illinois. Editorial and General Offices, 96-98 Park Place, New York.

WONDER STORIES—Monthly—Entered as second-class matter September 29, 1931, at the post office at Mount Morris, Illinois, under the Act of March 3, 1879. Title registered U. S. Patent Office. Trademarks and copyrights by permission of Gernsback Publications, Inc., 98 Park Place, New York City, owner of all trademark rights. Copyright, 1932, by Gernsback Publications, Inc. Text and illustrations of this magazine are copyrighted and must not be reproduced without permission of the copyright owners.

WONDER STORIES is published on the 3rd of the preceding month. 12 numbers per year, subscription price is $2.50 a year in United States and its possessions. In foreign countries, $3.00 a year. Single copies 25c.

Address all contributions for publication to Editor, WONDER STORIES, 96-98 Park Place, New York. Publishers are not responsible for lost MSS. Contributions cannot be returned unless authors remit full postage.

WONDER STORIES is for sale at principal newsstands in the United States and Canada.

IF YOU WISH TO SUBSCRIBE to WONDER STORIES, make out all remittances to the Stellar Publishing Corp. Be sure to mention the name of magazine you wish to subscribe for, as we are also agents for the following magazines: RADIO-CRAFT and EVERYDAY SCIENCE AND MECHANICS, subscription price of which is the same as WONDER STORIES. Subscriptions can be made in combination with the above publications, at a reduced club rate. Ask for information. Subscriptions start with current issue.

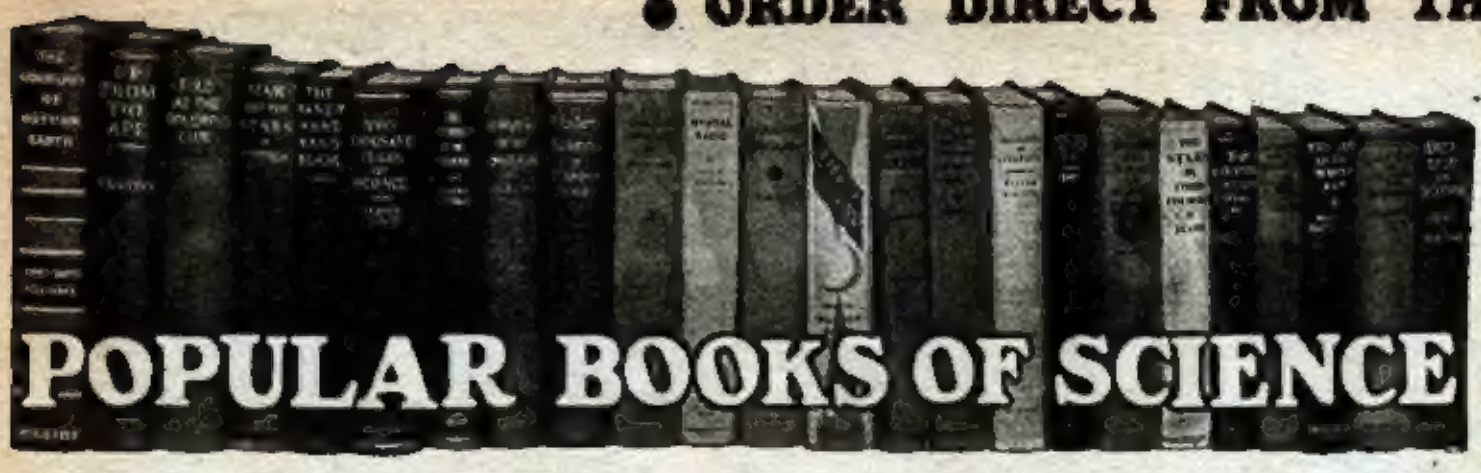
WHEN YOUR SUBSCRIPTION EXPIRES, we enclose a renewal blank in the last number. No subscription continued unless renewal remittance received.

CHANGE OF ADDRESS. Always give us old as well as new address and notify us as far in advance as possible.

Chicago Advertising Representative—L. F. McClure, 737 North Michigan Ave.
Western Advertising Representative—Lloyd E. Choppell, 220 No. Catalina St., Los Angeles, Calif.

London Agent: Hachette & Cie., 8 La Belle Sauvage, Ludgate Hill, E. C. 4
Paris Agent: Hachette & Cie., 111 Rue Reaumur
Australian Agents: McGill's Agency, 179 Elizabeth St., Melbourne

• ORDER DIRECT FROM THIS PAGE •



POPULAR BOOKS OF SCIENCE

We herewith present the most complete collection of recent important popular Science books. We have, after an exhaustive study, selected these volumes because they represent the foremost books of their kind in print today. There is such a great variety that we are sure it will satisfy any taste as well as any requirement of the student of science.

We publish no catalogues and ask you to be kind enough to order direct from this page. Prompt shipments will be made to you direct from the publishers. We merely act as a clearing house for a number of publishers and OUR PRICES ARE AS LOW OR LOWER THAN WILL BE FOUND ANYWHERE. Remit by money order or certified check. If you send cash, be sure to register it.

ASTRONOMY

MAN AND THE STARS, by Harlan T. Stetson. Cloth covers, size 5¾x8¾, 321 pages, illustrated. Price **$2.50**
The story of the adventure of astronomy, from the days when primitive man began wondering about the meaning of the heavens, through the work of the great pioneers of the science to the present day. Profoundly exciting.

DREAMS OF AN ASTRONOMER, by Camille Flammarion. Cloth covers, size 5¼x8¼. 323 pages. Price **$2.50**
The study of the heavens by the famous astronomer made as attractive as fiction. One of the most complete and authentic books on the subject ever written.

THE UNIVERSE AROUND US, by Sir James Jeans. Cloth covers, size 5¾x8¾. 381 pages. 24 Illustrations. Price... **$4.50**
A non-technical book which roves through the mysteries of modern physics and astronomy, opening up new vistas for the imagination. The very latest word in physical science. A marvelous work.

SIGNALS FROM THE STARS, George Ellery Hale. Cloth covers, size 6x9, 139 pages, 66 illustrations. Price..... **$2.00**
An amazing book on the possibilities of large telescopes, problems in building a 200" mirror telescope, how solar explosions affect the magnetic field of the earth and many other fascinating topics.

THE STARS IN THEIR COURSES, by Sir James Jeans. Cloth covers, size 6x8¾, 178 pages, 32 illustrations and maps. Price **$2.50**
Modern astronomy and the wonders of the universe as seen through the giant telescopes of today. An informal conversational style, and simple language has been retained.

POPULAR ASTRONOMY, by Camille Flammarion. Cloth covers, size 6¼x9¼, 600 pages, 288 Illustrations. Price.. **$6.00**
A general description of the heavens written in an interesting and lucid manner for those who wish to acquire a knowledge of astronomy without technicalities.

AVIATION

WINGS OF TOMORROW, by de la Cierva. Cloth covers, size 5½x8¼. 234 pages, 81 Illustrations. Price **$2.50**
When the inventor of the most revolutionary aircraft—the autogyro—speaks, we listen with respect. This book is a notable contribution to air transport set forth interestingly and convincingly.

OPPORTUNITIES IN AVIATION, by Walter Hinton. Cloth covers, size 5¾x8¼, 255 pages, 14 illustrations, map and charts. Price **$3.00**
This book tells clearly the innumerable opportunities in aviation in flying and servicing planes. Also those which involve design, repairing, selling and equipping planes, etc. Written by the famous aviator.

AVIATION AND ALL ABOUT IT, by A. Frederick Collins. Cloth covers, size 5x7½. 260 pages, 134 illustrations. Price.. **$2.00**
A complete volume covering all phases of aviation. Instructions in model airplane construction and design, in learning to fly, and numerous other aspects of aviation.

CHEMISTRY

THE AMATEUR CHEMIST, by A. Frederick Collins. Cloth covers, size 5x8¼. 310 pages, 77 illustrations. Price **$1.50**
An extremely simple but thoroughly practical chemistry book. A vast amount of practical information is given, also how to make and do things which will save time and money.

EXPERIMENTAL CHEMISTRY, by A. Fred Collins. Cloth covers, size 5x7½. 270 pages, 160 illustrations. Price **$2.00**
Here is a book that approaches the fascinations of chemistry in a new way. Contains a vast store of interesting and unusual material. THE book for experimenters.

THE MAKING OF CHEMISTRY, by Benjamin Harrow. Cloth covers, size 5¼x7¾. Price **$2.00**
A history of chemistry for laymen, told in terms of personal activities of great chemists, with special emphasis on modern industrial chemistry and its contribution to our civilization.

EXPLORATION

TOLD AT THE EXPLORERS CLUB, by Vilhjalmur Stefansson, Sir Hubert Wilkins, Col. Chas. A. Lindbergh, Capt. Felix Riesenberg, Dr. Roy Chapman Andrews and others. Edited by Frederick A. Blossom, Ph.D. Cloth cover, size 6x9. 425 pages, 34 illustrations. Price **$3.50**
A collection of the most thrilling and hair-raising tales of adventure ever gathered between two covers, told by America's greatest explorers. A marvelous book.

GENERAL SCIENCE

TWO THOUSAND YEARS OF SCIENCE, by E. J. Harvey-Gibson. Cloth covers, size 5¾x8¾, 382 pages, fully illustrated. Price **$3.50**
This authoritative work is meeting one of the greatest science needs of the general reader. Fascinating histories of the great inventors and discoveries with lucid explanations of their work.

UP FROM THE APE, by Harnard A. Hooton. Cloth covers, size 6½x9¼, 695 pages, 94 illustrations. Price **$5.00**
Here is evidence which scientists offer as proof of man's evolution. An amazing array of facts, figures and pictures set forth in an unusually entertaining manner. Whatever your own beliefs, you will find this book of intense interest.

EVOLUTION, by Vernon Kellogg. Cloth covers, size 5¼x8¾. 281 pages. Price **$1.75**
A thoroughly human book on a subject concerning which too much that is inaccurate has clouded popular conception. Untechnical but truthful explanations.

EXPERIMENTAL SCIENCE, by A. Frederick Collins. Cloth covers, size 5x7½. 280 pages, 153 illustrations. Price **$2.00**
A wealth of outstanding and surprising experiments are to be found in this book. Not only vastly entertaining, but also highly instructive. The book for amateurs.

SCIENCE TODAY, by Watson Davis. Cloth cover, size 5¾x8¼. 316 pages. Price **$2.50**
48 brief talks about the latest things Science has found out—about the sun, moon, stars, the earth, light, electricity, the weather, germs, the rest of man, and dozens of other absorbing topics.

SHORT TALKS ON SCIENCE, by Edwin E. Slosson. Cloth covers, size 5x7½. 281 pages. 28 illustrations. Price **$2.00**
This book is a brilliant compound of wisdom, and up-to-date information on what Man and Nature are accomplishing between them. A myriad new angles of science.

WONDERFUL STORY OF SCIENCE, by I. McFee. Cloth covers, size 5¼x8, 400 pages, 195 illustrations. Price.. **$2.50**
A complete story of the seven sciences interestingly and clearly told. Answers many questions that come up in every-day existence. A most practical book.

MASTERS OF SCIENCE AND INVENTION, by Floyd Darrow. Cloth covers, size 5x8, 352 pages. Illustrated. Price **$2.25**
Brief but fascinating biographies of 50 leading scientists from Galileo to Einstein that place each man against the background of the ideas of his time and then show him working out his discovery.

HEALTH

HOW TO LIVE LONGER, by Robt. D. Lady, M.D., and John C. Frank. Cloth cover, size 5x7½. 140 pages, 40 illustrations. Price **$1.50**
This book convincingly points the way to the achievement of robust old age. Once begun, you will read straight through—and with much profit.

INVENTION

THE PSYCHOLOGY OF THE INVENTOR, by Joseph Rossman, Ph.D. Cloth covers, size 5¾x8¾, 282 pages, 23 illustrations. Price **$3.00**
A comprehensive picture of the inside of the inventor's mind. Observations from 710 prominent inventors are quoted. Many absorbing topics discussed, also facts never before in print. No inventor should miss it.

MECHANICS

EXPERIMENTAL MECHANICS, by A. Frederick Collins. Cloth covers, size 5x7½, 282 pages, 167 illustrations. Price **$2.00**
The most fascinating book on mechanics. Chock full with experiments you can make; all mechanical luck and clock movements, as well as perpetual motion to perfection.

THE HANDY MAN'S BOOK, by C. T. Schuster, M.E. Cloth covers, size 6x8¼, 341 pages, 14 illustrations and diagrams. **$4.00**
A complete manual covering every phase of repair and maintenance work in the home, factory, office and farm, readily understood and applied by the non-professional worker. A fine book.

THIS MECHANICAL WORLD, by Morton Mott-Smith, Ph.D. Cloth cover, size 5x7½, 233 pages, 45 illustrations. Price **$2.00**
Both for the student and layman, this book gives a tremendously interesting account of our mechanical civilization, historical as well as modern, as has never been done before.

How to order

We cannot ship C.O.D. Our prices are net, as shown. Please include sufficient postage, for Parcel Post, otherwise books must be shipped by express collect.

MICROSCOPY AND PHOTOGRAPHY

SCIENCE AND PRACTICE OF PHOTOGRAPHY, by John R. Bonbook. Cloth covers, size 5½x8¾, 238 pages, 82 illustrations. Price **$2.50**
A practical book for the professional and amateur. Covers thoroughly and lucidly the entire elementary ground of photography. Invaluable information and suggestions.

THE BOOK OF THE MICROSCOPE, by A. Frederick Collins. Cloth covers, size 5x7½. 245 pages. 71 illustrations. Price.... **$1.50**
Simple but vivid descriptions of all the wonderfully fascinating uses of the microscope. Plant and animal life, curious hygiene facts, the microscope in criminal investigation are but a few of the subjects discussed. Splendid for experimenters.

MISCELLANEOUS

HOUDINI'S ESCAPES, by Walter Gibson. Cloth covers, size 6x8, 315 pages, illustrated. Price **$2.00**
The first and only authentic record of the actual methods devised and used by Houdini. Explains his modern miracles in non-technical language. Learn how this master accomplished the impossible!

THE AQUARIUM BOOK, by Boulenger. Cloth covers, size 5¾x8¾, 268 pages, 87 illustrations. Price **$3.50**
Just the book for those interested in home aquariums. Covers the subject clearly and thoroughly with many helpful suggestions.

MOTION PICTURES

THE TALKIES, by Arthur Edwin Krows. Cloth covers, size 5x7½, numerous illustrations. Price **$2.00**
245 pages. Price **$2.00**
This volume is chock full of easily-understood descriptions of the numerous processes that go to make up the working formula incident to making "talkies."

THE ART OF SOUND PICTURES, by W. Pitkin and W. Marston. Cloth covers, size 5¾x8, 287 pages. 15 illustrations. Price **$2.50**
The first book to give definite and practical advice on how to write for the talkies. Indispensable for writers who hope to make money by selling for talking pictures.

PHYSICS

FOUNDATIONS OF THE UNIVERSE, by M. Luckiesh. Cloth covers, size 5¾x8¾, 233 pages, diagrams and tables. Price **$3.00**
A popular treatment of physical science which talks entertainingly and without recourse to mathematics, how man has utilized to his own advantage the great primary laws he has discovered.

THE NATURE OF THE PHYSICAL WORLD, by A. S. Eddington. Cloth covers, size 5¾x8, 353 pages, charts. Price **$3.75**
One of the most fascinating books dealing with the complex problems of physics, philosophy, etc., that has appeared. Thoroughly important and thought-provoking.

THE MYSTERIOUS UNIVERSE, by Sir James Jeans. Cloth covers, size 5¾x9, 190 pages, 9 plates. Price **$1.00**
An illuminating treatise which ranges from Newton to Einstein. A noteworthy book which promises a new era in scientific thinking. Cannot be ignored if you wish to be in touch with modern thought.

THE EINSTEIN THEORY, by Samuel H. Guggenheimer. Cloth covers, size 5¼x7¾, 300 pages, illustrated. Price **$2.50**
A simple treatment of the Einstein theory with a minimum of mathematics. Sheds an illuminating light on a much discussed and misunderstood theory.

THE UNIVERSE, by Frank Allen. Cloth covers, size 5¼x7¾, 145 pages, 31 illustrations. Price **$2.00**
The Theory of Relativity explained absorbingly and fascinatingly with an adventurous flavor, and with the least possible technicalities. Sound science, skillfully presented. The perfect book on relativity for the layman.

SEXOLOGY

THE SEXUAL SIDE OF MARRIAGE, by M. J. Exner, M.D. Cloth covers, size 5x7¾, 282 pages, illustrated. Price. **$2.50**
An understandable book free from sentiment or hypocrisy, for those who seek marriage at its best. Deals frankly with intimate marriage relationships, especially at crucial points where ignorance and misinformation are often disastrous.

THE BANKRUPTCY OF MARRIAGE, by V. F. Calverton. Cloth covers, size 5½x8, 344 pages, illustrated. Price. **$3.00**
An attack on the prevailing stupidities with which most people treat sex, and why ignorance has reduced us to our present moral chaos. The necessity for change in our ideas of love, marriage and sex life made clear.

COMPLETE BOOK OF SEX KNOWLEDGE, by Dr. Bernard Bernard. Cloth covers, size 7½x5, 331 pages. Price **$2.75**
At last here is the book which dispenses with conventionalism in the discussion in detail of the whole sex problem. Not a single side of the sex question that has not been fully treated.

SEX CONDUCT IN MARRIAGE, by Dr. Bernard Bernard. Cloth covers, 7½x5¾, 218 pages. Price **$1.75**
Answers simply and directly intimate questions which the author has been called upon innumerable times to answer. A sound understanding of sex conduct in marriage by simple, straight-forward explanations. A most valuable book.

WOMEN, HER SEX AND LOVE LIFE, by Dr. William J. Robinson. Cloth covers, size 5¾x8¾, 411 pages, numerous anatomical illustrations. Price.. **$3.00**
A real book dealing with intimate relations of woman's sex and love life. Full of practical information of vital importance to every woman, and through her to every man.

ZOOLOGY

INSECT STORIES, by Vernon Kellogg. Cloth covers, size 5x7¾, 286 pages. Price... **$2.00**
A delightful book which takes you to the insects' haunts. Tells how they live and what they do. Written in story-like form.

LIFE OF THE WHITE ANT, by Maurice Maeterlinck. Cloth covers, size 5¾x7¼, 320 pages. Price **$2.50**
A fascinating history of the life of an amazing insect—the white ant. The famous author relates many strange, unknown and curious facts about these odd little creatures.

SCIENCE PUBLICATIONS

84W PARK PLACE
NEW YORK, N. Y.

We can get ANY book in Science or Mechanics, Radio, etc. Just furnish us with Title and Author or tell us in which topic you are interested.

TURNS COLD WATER INTO HOT WATER INSTANTLY!

ONLY $3.95 COMPLETE

Earn $10 to $20 DAILY

Trade-Mark Reg. U. S. Pat. Off. Pat. App. For.

7 EXCLUSIVE FEATURES

Here's the biggest Money-Maker in years; Men with no experience average $9.60 daily. Scores of others earn from $30 to $40 daily from May to October. Water-Matic is a sensational summer seller. Fires are out for the season and hot water is not always available. Cash in on the naturally heavy demand. Our simple sales plan brings 7 sales from 10 demonstrations. It's easy. We show you how. 20 MILLION HOMES WIRED for electricity are waiting for this needed utility. Doctors, Dentists, Druggists, Garages, Stores and business places find it indispensible. Summer Camps and Cottage Colonies can be sold on sight. If you are looking for a big pay job, take this proposition while the season is still young. Make a year's salary during the next three months!

Water-Matic is giving satisfaction to thousands of housewives and business people. It's practically indispensible when once it is used. Just snap Water-Matic on your cold water faucet, plug into a convenient electric outlet and in 30 seconds or less you have hot running water. No need now to heat a whole tankful of water when only a small quantity is wanted. It saves its own cost by lowering fuel bills. You have hot running water when and as you want it.

THIS MODERN MIRACLE

is a blessing for preparing baby's bath, heating baby's bottle, or a hot water bag; washing dishes, lingerie and fragile items of apparel; for shaving; for sick room; for emergencies. If it were never used for anything except for emergencies it would be well worth its price. 70% of all cases of indigestion strike late at night when fires are low and hot water is not instantly available. Have a Water-Matic handy for just such emergencies.

Every Water-Matic comes to you completely equipped, ready for use on either A.C. or D.C. 105-120 volt current.

Get into BIG MONEY

Why half-starve on a part-time job when you can get into the BIG MONEY with WATER-MATIC!

No experience needed. Once you see how WATER-MATIC works on your own faucet, you become so enthusiastic NOTHING CAN STOP YOU!

We show you everything—how to demonstrate, how to close sales, collect your CASH. Start in Spare Time—10 Sales, an evening's Easy Work, nets you $12.00 CASH IN HAND. *Full time earnings averaging 25 Sales a Day net you $30 a Day. $180 a Week. $780 a Month. More than $9,000 a year.* Territory is Going Fast. Tomorrow May Be Too Late.

THIS COUPON BRINGS AN OUTSTANDING OPPORTUNITY
TO MEN DESIRING INCREASED INCOMES
WATER-MATIC HEATER CORP.
246 Fifth Ave., Dept. 855, New York, N. Y.

I enclose $3.95 for one complete Water-Matic Sales Outfit. I understand that I am to demonstrate Water-Matic and take orders at $3.95 each. I will collect $1.30 as my commission and send the orders to you for delivery direct to my customers C.O.D. for the balance of $2.75.

Name _____

Address _____

City _____ State _____

No C.O.D.'s—Please send postal or Express M.O.

MAIL THE COUPON AT ONCE

WATER-MATIC

EDITORIAL PAGE
SEPTEMBER, 1932
Volume 4 Number 4

WONDER Stories

HUGO GERNSBACK
Editor-in-Chief
DAVID LASSER, Managing Editor
C. A. BRANDT, Literary Editor
FRANK R. PAUL, Art Editor
C. P. MASON, Associate Editor

THE WONDERS OF DREAMS

An Editorial by HUGO GERNSBACK

● The history of dreams is as old as the recorded history of the human race. Dreams probably antedate the human race; for it is well known that many animals dream. Anyone who has heard a dog bark in its sleep or give other indications of a form of dream consciousness must conclude that it was dreaming.

It is probably true that the higher animals dream at times; but whether the lower animals, such as insects, dream is not known for a certainty, although there are indications that they dream too.

The phenomenon of dreams is only imperfectly understood today. It has been accepted by most scientists that, when you sleep, all the restrictive bars are down, and that the thing which we call *will* no longer exerts its complete influence over the nervous system and its directing brain.

The will may be compared to a brake on a car, the wheels being the nervous system directed by the brain. If the brake be taken off the car may run wild, without direction. With the brakes on, the wheels (brain) are under control. This, of course, is only a sketchy explanation of dream phenomena, and one that does not cover the whole action.

It has been said before that, while we sleep, our subconscious self does not sleep. All our senses are, as a matter of fact, as alert as they are during our waking hours. We still hear; we still feel; we still smell; we can still taste while we are asleep, just as well as when we are awake. We can still see; thus, light coming through the eyelids will in most cases wake us up.

As to the significance of dreams, scientists today are not in full accord with Freud, whose theories seem to have been that most dreams are mere representations of suppressed desires. The majority of dreams certainly do not come under this classification. Nine out of ten dreams could not be interpreted in this manner and here is proof that they cannot:

Years ago, in some research work undertaken by the writer, he produced what he termed a "mechanized" dream. (Contrary to many opinions, the usual dream is not in itself an entity that comes on one involuntarily; there is a cause for everything, and dreams are no exception to that rule.)

The writer proved in his experiments that he could *induce* dreams by mechanical means. For instance, in one of the many experiments, a sleeping subject could be made to dream definite preconceived things. Thus, when he caused a sleeping person to smell a perfume and woke him within a few seconds, in most cases, the subject reported a dream in which the scent was present. Some dreamed about smelling flowers; others about buying perfume; still others walked in a garden, etc.

Other induced dreams were interesting, in that a warm object pressed on the hand or foot induced dreams that had to do with heat sensations, with fires and the like. The sense of hearing also was tested by making various subdued noises near the ear of the sleeper. In this case too, induced dreams were readily had. In one case the clapping together of two pieces of wood near the ear of the sleeper brought about a dream that concerned the firing of a cannon. Of course, the noise was in no case loud enough to awaken the sleeper, but sufficiently loud to make sure that he actually heard it.

These experiments may be far more important in the future than they are now. In certain nervous and other diseases, in order to prevent the patient from having violent dreams, such as nightmares, it is necessary either that the subject sleep a dreamless sleep, or else we must provide the mechanized dreams. Most people know how terrible a dream can be, and how the heart can be overtaxed by a nightmare. It is also possible that many subjects, afflicted with heart trouble, die in their sleep as a result of violent dreams.

It is quite possible that in the future, the mechanized dream theory will be worked out in such a way that people will dream only about harmless things. It will induce better sleep and, consequently, better health.

THE ASSOCIATE SCIENCE EDITORS OF WONDER STORIES
are nationally-known educators who pass upon the scientific principles of all stories.

ASTRONOMY
Dr. Clyde Fisher, Ph.D., LL.D.
Curator, The American Museum of Natural History.
Professor William J. Luyten, Ph.D.
Harvard College Observatory.

ASTROPHYSICS
Donald H. Menzel, Ph.D.
Lick Observatory, University of California.

AVIATION
Lt. Col. William A. Bevan, B.S., M.S., M.E.
Air Corps Reserve, Professor Aeronautical Engineering, Iowa State College.
Professor Earl D. Hay, B.S., M.S., M.E.
Head Department Mechanical and Industrial Engineering and Professor of Aeronautics, University of Kansas.
Professor George J. Higgins, B.S., Aero. Eng.
Associate Professor Aeronautical Engineering, University of Detroit.
Professor Felix W. Pawlowski, M. & E.E., M.S.
Department of Aeronautical Engineering, University of Michigan.

Professor John E. Younger, B.S., M.S., Ph.D.
Department Mechanical Engineering, University of California.

BOTANY
Professor Elmer G. Campbell.
Transylvania College.
Professor Margaret Clay Ferguson, Ph.D.
Wellesley College.
Professor C. E. Owens.
Oregon Agricultural College.

CHEMISTRY
Professor Gerald Wendt.
Editor, Chemical Reviews.

ELECTRICITY
Professor F. E. Austin.
Formerly of Dartmouth College.

ENTOMOLOGY
William M. Wheeler.
Dean, Bussey Institution for Research in Applied Biology, Harvard University.

MATHEMATICS
Professor Waldo A. Titsworth, B.S.
Alfred University.

MEDICINE
Dr. David H. Keller.
Pennhurst State School.

PHYSICS AND RADIO
Lee deForest, Ph.D., D.Sc.

PHYSICS
Professor A. L. Fitch.
University of Maine.

PSYCHOLOGY
Dr. Marjorie E. Babcock
Acting Director, Psychological Clinic, University of Hawaii.

ZOOLOGY
Dr. Joseph G. Yoshioka.
Yale University.

(Illustration by Paul)

His eyes seemed to see in the machines, the shapes of monsters ready to tear him to pieces. He heard a stifled cry from the direction of the big engine.

THE DEATH OF IRON

By S. S. HELD

Translated from the French by Fletcher Pratt

● We know that our present civilization is founded on our use of metals. Destroy our metals and human beings would be no better off than their forebears of the stone age. What would happen then if some mysterious disease were to attack our metals and spread swiftly, like a contagion, throughout the entire earth?

This unusual story, with that powerful theme, we have imported from France, after its sensational success there. It gathers force as it goes on, and we will see before the last word is read, the coming of a devastation such as the race has never known. M. Held has a power over words that gives fiery reality to his stirring events.

WONDER STORIES has had this story translated by the popular author, Fletcher Pratt and presents it in English for the first time to our readers.

The first installment follows.

● Raymond Leclair, contemplating the incredible results of his tests, decided that the blame must be placed not on science but on fallible human nature. He checked over the operations once more, searching for the source of the error which must somehow have crept into his formulas, but it continued to elude him.

In reality he was very little disturbed, but there are certain phenomena which impinge on the routine of every scientist, which require a special terminology to account for them. This was one of these cases; Leclair searched his memory for the proper words as he gathered his working papers together, left the foundry, mounted a stone stairway and pushed open the door of the material-testing laboratory.

It was a large room with white walls and a tiled floor, littered with various machines and pieces of apparatus. It was already nearly noon, but the dull October sky shed only a feeble light through the windows and surfaces of steel and brass reflecting the glare of the electric lights.

In one corner of the room a tall, thin young man with a long, horsey face was bent attentively over a testing stand watching some machine through thick glasses. Leclair, extending toward him the graph which was the result of his investigations, began a laborious explanation . . . Pierre Selevine, always rude when at work, pushed away the extended paper without replying.

With eyes fixed on the needle that was registering his results he attached a weight whose pressure, multiplied through a system of levers, was crushing some mass of heated material. His fingers moved with precision over the polished shafts, regulating the application of the heat or the speed of rotation of the moving parts. Understanding that it was useless to interrupt at present, Leclair stepped aside.

The melancholy light threw a sad and aged expression onto the faces of the pair.

Through the windows the ruddy orb of a sun, deprived of all strength by shrouding veils of mist and smoke, was barely visible. Under its gloomy inspection an industrial city was engaged in its daily tasks. From the window through which Leclair was surveying the scene, he could catch a confused view of the habitations of the workmen, a fragment of the river and of the factories of the city of Denain, arranged in neat cubistic patterns of building and chimney.

The Escaut River glided past docks encumbered with the merchandise of the world and beneath a tracery of bridges and cranes. Imprisoned by dams, stained with oil and coal-dust, the water seemed to be made of solid metal. Only for an instant would its surface be troubled by the passage of some tug dragging its long train of laden barges, rolling the water away from their prows in sparkling ripples. In the distance the horizon was hidden by an agglomeration of buildings dominated by blast furnaces.

Sensitive as he was to delicate forms and colors Leclair detested this corner of the earth which had been rendered so ugly by the industry of man. A confused rumbling went up from it night and day a rumbling that was produced by mighty machines in factories where thousands labored, of thundering hoofs and groaning wheels and bridges that vibrated under the weight of passing trains.

Muscular workmen toiled in the mines and at the banks of the river. Others hammered the softened metal in the light of its own fires; lineal descendants of the men of an earlier age who poured the molten bronze from crucibles of stone, they continued man's conquest of inanimate nature, forging the tools which gave to one feeble animal his dominion over all the rest. After this victory over all the beasts of earth, man still fought here, forcing rebellious metal to his service at the price of toil and torment.

Leclair was absorbed in the contemplation of the scene when someone called his name softly. Turning, he saw Fanny, the girl who polished the gauges of the testing laboratory. Seated behind a grinding machine, she beckoned to him. She was from Waes, a daughter of the

laboring classes, somewhat frail and with a certain grace. She admired this young man, so elegant in his sober and well-tailored clothes, so different from the gross workmen among whom her lot was cast.

Leclair stepped over to her, and to pass the time, asked for news of Laval, her lover, a mechanic from Paris, who beat her and was in the habit of exploiting her.

She shrugged her shoulders.

"Oh, Julien!" she said, "I'm off him for good."

Leaning toward the engineer, she regarded him languidly through half-closed lashes. Her lips seemed to offer themselves . . . With a start she recoiled; the door had opened suddenly behind her and in came Pillot, the electrician, dirty from head to foot, late and in a hurry, as was usual with him. He covered the ten kilometers that separated his home from the factory of Moran and Co., by bicycle and lived in a perpetual horror of rain. After the usual lamentations about the state of the roads, he went grumblingly about his tasks.

● Selevine, having finished what he was doing, drew a short pipe from his pocket, filled and lit it, and without a word, came over to shake Leclair's hand. Then, noticing for the first time the graphs in which Leclair had expressed the results of his tests on the high-speed steels, he seized them eagerly, reading these cabalistic documents as an ordinary man might a newspaper. They told a tale of overworked metal, of the labor of interior forces, and finally of the crystallization and dry fracture of the material at a point where it should have been sound. His face exhibited an increasing astonishment.

"What in the world have you done?" he demanded, "I don't understand."

"Nor I," replied Leclair. "Your formula must be defective."

"You're joking! Why, only a few days ago we got the most wonderful results. There must be an error in calculations."

"But I assure you . . ." protested Leclair.

"Oh, well, never mind. It isn't important. We'll take another sample, that's all. Anybody can make a mistake. I just finished my experiment with a mixup as bad as yours. You know I've been studying natural steel alloys for some time. Their properties are not very well known. Some of them have an enormous amount of tensile strength but they are unstable and nervous; under a shock they break like glass. Very little use in industry, of course, but they offer an interesting field of research. I had succeeded in producing a ductile high-carbon steel, but after a little time its cohesion seems to have been spontaneously destroyed. Queer, isn't it?"

"But how do you explain it?"

"I have been trying to interpret the phenomenom by calculation. It's a tough job. Yesterday, I was at it late, working over this formula, burying myself neck-deep in mathematical analysis. For a moment I thought I had discovered something. I stopped working and went over to the window to get a breath of fresh air. My room looks out over the Essel Forge shop. As I stood there I could see the men hammering the metal amid the flames, and for some reason the spectacle filled me with a kind of exultation. It seemed to me that I was just at the edge of translating into comprehensibility one of the most profound secrets of the material universe; that I was about to express all the transformations of iron in a single formula . . ."

He stopped as though a little ashamed of his enthusiasm, his eyes roaming about the room.

"Where was I? Oh, yes—I turned back to the table. When I had worked out the results of all the formulas, simplified their products, I found I had for a solution—a mathematical expression that could not be expressed by any material result and which was inherently absurd. I could have wept with rage. Every time I try to solve certain problems of metallurgy I run into the impossible . . . Do you know, there are crystalline equilibriums in metal that are quite unpredictable, very much like the reactions of living matter."

An old workman, clad in the blue jumper of a mechanic, shuffled into the laboratory and approaching Selevine, informed him that a new lot of metal was ready to be examined.

The two engineers went toward the foundry, which was located beyond the workshops. Passing along a gallery which ran around the building at a height of twenty feet above the generators below, they stepped suddenly into a deafening chorus of sounds. Beneath their feet in the blue artificial day of the arc-lights, electric motors whirled in their carapaces of steel. Dynamos added their heavy monotonous note to the din, and traveling cranes rumbled about them.

It was a harmony of swift, precise movement, of the extension and retraction of driving rods in feline gestures, of the calculated mad interlocking of gears, of rapidly-moving cams and pinions. The machines toiled with the metal all around; a mighty knife sliced it into sections, a hundred lathes peeled the sections like so many fruits; the files bit it with their fine hard teeth; the grinding wheels shaped it amid a display of burning sparks, silvery-shining drills bored to its heart, saws tore at it. Modified in form and substance the steel cried out with a thousand voices—some raucous, some sonorous, shrill squeals and shrieks of agony. Then, out-sounding all the rest, came the heavy beat of a trip-hammer on a plate.

They encountered the superintendent of the factory.

"Well, how about my test figures?" he asked.

Leclair hesitated, and then promised: "You'll get them by the end of the week, Monsieur Lefevre."

As they reached the foundry a puddler came to assure them that the steel was ready.

The converters, of the old type, with crucibles, were subterranean, and were heated by gas-jets, the flow of which was regulated from above the ground. Lids of refractory earths half-closed the vents from whose mouths there now escaped puffs of suffocating heat.

Right before one of these openings a foundryman clothed in his tabard of leather and wet gloves, plunged in a long-handled pair of tongs and drew forth a crucible of the metal, whose burning white changed to a rose color as it struck the outer air. With another tool he skillfully skimmed the floating scum from the pot, and turning out a glob of rapidly hardening metal, dropped it beneath a hammer which struck it flat in a shower of sparks. The glowing blade of metal, tempered in icy water, was seized by the jaws of two gigantic pincers and broken in half. Selevine, examining the grain of the fracture, declared the fusion of the metal satisfactory.

● Through drawn lashes he contemplated the white hot steel making several observations about the heat-treatment of the other batches in the converters. He went to and fro in the narrow place without seeming in the least affected by the heat, experiencing a singular pleasure in breathing the superheated air, halting here and there to examine samples of the batches under treatment. His companion, who had gone outside, heard the noon bell ring without seeing him reappear, and without waiting any longer left the factory with the last groups of workmen.

There was a special canteen for the engineers at the side of the shop, but Leclair preferred to take his lunch outside the premises in a little restaurant where Selevine and Pillot frequently joined him. Today he was alone in the stall reserved for guests of importance.

A waitress brought him a plate-lunch of plentiful size, which Leclair finished with rapidity.

Sniffing the odor of his lukewarm coffee mingled with that of his cigarette, he abandoned himself to vague reveries. The incidents of the morning passed in review before his mind, and he considered unhappily the prospect of having to repeat his task.

Once more he regretted having left Morocco and demanded of himself if he had not interpreted the promises of Morain, his employer, in a manner too favorable to himself. But the chance had been too good to be missed. At thirty an engineer should be on the road to success; and the head of the steel company had certainly been generous.

Aside from practical considerations there was the presence of Mme. Morain at Denain to keep him there. He recalled the grey eyes and delicate profile of Renée Morain and all his evil humor disappeared.

One o'clock. Near him the steel-workers in blouse and overalls, their heavy muscles rippling under dirty skins, were consuming their lunches, washing them down with draughts of cider or wine.

Leclair went out. A single ray of sunlight, striking athwart two clouds, gilded the side of the street which, always deserted at meal-times, was now beginning to fill up again. A group of workmen emerged from a wine-shop, saluting the engineer awkwardly. At the corner ahead he saw Pillot get out of a car, and made a detour to avoid being bored by his conversation. It took him down a street where a group of working girls went, clothed in grey, bare-headed, youth in them triumphing over the effects of labor. One of them, in whom he recognized Fanny, turned toward him with a clear peal of laughter.

The young man turned away, annoyed. He could not understand how he had come to be caught in a provoking flirtation with her, and recalled with a certain repugnance how they had stood in the angle of the passage that led to his part of the factory. As she leaned to him he had felt the lithe young body under the sordid grey clothes and had kissed her full on the lips. It was dark there; neither of them had seen the approach of Selevine, who stood regarding them with a smile. Leclair, irritated, had questioned the Russian.

"Well, what do you want to butt in for?"

Selevine had shrugged his shoulders.

"Perhaps you didn't know that girl has a lover?"

"And what of it?"

Since that revelation Leclair had avoided the company of the young working-girl. Seeing her there in the street, laughing and gay, he wondered how much truth Selevine's innuendo had contained. A mere lie, perhaps.

S. S. Held

CHAPTER II

First Trouble

● For eight months, Leclair had been working under Selevine's orders at the factory of Morain and Co.

His principal duty was that of testing the high-speed steels which were the specialty of the firm. He performed this task well, but without enthusiasm and with a regularity that had become a trifle mechanical.

His chief, on the other hand, took a passionate and irregular interest in his work. He was in bad health and was subject to violent fits of depression; but he was interested in what he did and for days would let it keep him even from eating and speaking. Then all at once, his humor would change without any reasonable cause.

Selevine was also interested in mathematical physics, and took a certain mystical pleasure in the material with which he labored. Taking Leclair into the foundry he would show him by what substances incorporated in the fluid masses and by what methods of heat-treatment the different types of steel were produced.

There, amid the mystery of ingenous combinations, the radiant body of the metal was altered. The Fire-god reigned.

Fire took all the diverse forms of which it is capable; appeared in tongues of purple, in ruby-colored vapors, in gems, in wild dream-flowers.

It expanded throughout the irons as they fused, pierced the heart of every blast-furnace and slept in the cold blocks of steel, ready to waken under a shock.

At the gesture of the foundryman, naked beneath his leather tabard, a retort would turn over. A jet of violently-driven air, suddenly released into the mass, sent long golden flames tipped with purple, rushing from the mouth of the vessel amid a terrible roaring; vaporized jets of lava, sulphur-yellow, emerald-green and striped with violet vapors, dashed forth to break in showers of twinkling stars.

The steel was refined in electric furnaces girdled with brass. Tremendous accumulations of energy were gathered in these pockets of silica and refractory brick. Then, with the current, shut off, the electrodes were lifted out by systems of automatic counterweights and the steel poured out in little brooks whose whiteness struck the eye with blinding brilliance.

Samples were taken from the cooled ingots. The microscope revealed their crystalline structure. Under the object-glass of that instrument could be distinguished the curious designs of the material-mosaics and carpet-patterns with interweaving lines. The hard, fracture steels gave

a delicate pale blue field starred with tiny white grains; the mild steels had delicate waterings with shell-like patterns like those in silk or mother-of-pearl; others were graven with tiny hieroglyphics. Only Selevine could read correctly these inscriptions that told the story of the inner life of matter.

To the information he thus obtained was joined that which resulted from the various mechanical tests. Machines as precise as watch-movements subjected the samples to slow traction, tension or torsion. The fact that they moved in well-oiled silence did not exclude their possession of indomitable force.

The engineer, bending his thin, bony face over the machines, would follow the movement of a needle on a scale or of a stylograph across a drum. Levers as sensitive as the antennae of an insect seemed no more than the prolongations of his delicate fingers, as with the slightest of touches he applied the force that rent the material apart.

In those machines chains were pulled to deformity and breakage; steel cables gave way, their sections vibrating one by one, as the torn ends leaped into the air like the heads of snakes.

Another machine determined the hardness of steels by the depressions left in their surface by a ball driven into it by titanic pressure; another filed the surfaces with a curious duplication of human gestures in the process.

Shining with reflections under the cold electric lights, the instruments appeared as torturing implements of some nightmare. Inquisition, at the same time suggesting the stiff movements of giant insects, which, with articulated limbs and heavy carapaces, tore to pieces in their mandibles the living body of the metal.

* * * *

It was while testing samples of high-speed steel that Leclair thought he found the machines less supple and sensitive than before. One might almost have said that some heavy and ignorant hand had fumbled with them until they became tired from abnormal efforts; and yet the effect was so tenuous as to be beyond the range of observation. The engineer had only a vague impression of something that he was unable to pin down.

Several days later, as he was passing through the lathe department he heard voices raised in argument. Choleur, the foreman, who exercised a violent and somewhat capricious authority over his subordinates, was shouting that someone had, for a second time, broken an important part of a big automatic lathe. The workman in charge of the implement was defending himself vigorously, and calling on his fellows to bear witness that he had regulated the instrument correctly. He complained that it must have contained some hidden defect which had brought about the fracture.

● In spite of his protests the mechanic was dismissed. But the man who replaced him was no more lucky; a few days later the main rod of a turret-lathe bent suddenly. Engaging in the mass of rotating metal the jaws tore loose the tools and their attachments, injuring the man who was guiding the machine. The same day the sliding parts of a big plane suddenly collapsed.

Choleur filled the air with his curses.

Suspicious and with side-glances at the men about him, he examined the sections that had failed. The idea that this series of accidents was not the result of chance had occurred to him. Lefevre had the same thought but neither of them could find the slightest basis for such a conclusion. They reluctantly accepted the misfortunes as purely fortuitous, when four days later, the main power-transmission shaft of the shop suddenly gave way, tearing down some of the steel trussing of the roof in its fall.

Microscopic examination of the breakages revealed to Selevine a steel that had been submitted to extraordinary stresses, fatigued by over-exertion.

"It must be that big hammer," he told Leclair when they were in the laboratory together, "the one they installed near the lathe-room recently. The continual shocks set up a vibration in machines already submitted to considerable strain, and in the long run bring about a modification in the structure of the metal which breaks down its resistance. At least, that's the only explanation that occurs to me."

The electric light died out as he spoke, then flashed once, and went out for good.

Leclair telephoned to Laval for the breakdown gang. The wire carried a series of not very pleasant remarks to his ears in reply. Annoyed by the imperative tone of the engineer, the mechanic was objecting vigorously.

"I don't know what's the matter with everyone around here lately," declared Leclair in an irritated tone. "If I were the boss . . . That man Laval is becoming impossible. He counts on his stand-in with you, and I can't ask him to do a single thing without getting some kind of an insolent answer. With Martin, I ran into the same hostility, only he hides it under a good-natured air that doesn't mean a thing. The old fool exaggerates his deafness so as to interpret orders in a manner to suit himself.

"In order to avoid labor he deploys all the resources of his intelligence; once the danger of having to work is over he has to take a long rest to recover from the shock of being asked to do something. He sleeps on the job with a skin-full of wine, too. Decidedly, these workmen have no ideal but getting drunk."

"At least that's a concrete idea," replied Selevine, tranquilly, "and about the only concrete idea that anyone has these days."

"You're point of view is all wrong, old man. Believe me, it's necessary to be firm with people like that. The least indulgence they interpret as a sign of weakness. You have to be severe with them to get any respect. My predecessor at Said Machou was a humanitarian of your type. He had what are called 'advanced ideas' and tried to apply some of them in the department he directed. The result was even beyond his hopes. Three months after he came on the job it was impossible to get any kind of effective work out of the laborers. Their demands grew in proportion to what they got. The more inoffensive ones merely kept happily 'stewed' all day long. The workshops were full of public women and public brawls. At the least excuse the Italians hauled out their knives and threatened to start cutting throats. Most of the time they did their threatening from a distance, though—out of delicacy of sentiment, I suppose. Every time they tried to clamp discipline on again there was a strike and a miniature riot."

"And then you appeared on the scene?"

"I did. I chased the foreigners and horsewhipped a few of the natives—under due form of colonial justice, of course. But it was too late. They never really reestablished order."

Leclair's glance fell on the big microscope of which

Selevine was adjusting the screw. The half-shaded lamp lit the pale profile of the observer, outlining his sharp nose and finely-graven lips, and emphasizing the bitterness around the corners of the mouth and the heavy-lidded eyes, red with sleeplessness.

"You're tiring yourself, old man."

The other shrugged his shoulders.

A vague pattering was audible in the adjacent corridor. Leclair glanced at the clock on the wall and as he did so, someone in a white laboratory coat entered.

"Well, gang, it's 'the hour'!"

It was thus that Pillot designated the hour par excellence, the hour of quitting work. At the same moment came the piercing sound of the factory whistle.

After a rapid toilet, the young men mingled with the crowd of laborers which the factories were disgorging into the mean streets of the industrial city.

CHAPTER III

The Soul of Metal

● Leaving the factory, Leclair went home, slipped into his evening clothes and directed his steps toward the Morain home.

His way lay through the hamlet of Trechy, almost entirely devoted to workmen's homes; little, narrow streets whose squat houses and smoke-grimed walls looked incredibly ugly in the trembling light of the old-fashioned street-lamps. A little further on, the buildings began to space out; he found himself in a district where a frantic, hurried existence was carried on behind glass and steel. Bridges swung their long legs across the waters of a canal. United by long lines of wire, electric moons threw their somewhat sinister light across the ocean. Coal dumps, rails, locomotives, piles of ore or scrap iron rose out of the darkness here and there.

A quarry opened beside his path. Mercury-vapor lamps threw heavy shadows around laden men and overworked horses in the ravined declivities. A wheel turned at the shaft-mechanism of a mine; a big machine moved somewhere with a rhythmical beat.

Passing the Naval foundry he saw the red light streaking across the sky, while every one of a thousand windows reflected it back. Lit by the blazing furnaces below, the pillars of smoke took on a kind of magic splendor.

But Leclair was indifferent to the splendor of the spectacle. He walked along in a kind of waking dream, his mind at random over the events of the day, his memories of the Rail Marocains, the thought of what his share in the commission on that sale would amount to, and the wife of his superior.

With a certain simplicity, he argued out the affair: "She made a marriage of convenience. In a big city, she would already have taken a lover, but here the opportunity is lacking. Certainly she ought to be bored with life." He did not carry this line of reasoning through to its logical conclusion, for, without in the least counting on her yielding to him, he was imagining a tender, almost Platonic love-affair, which would become more only by one of those accidents that chance places in the way of lovers.

This hesitation in his imaginings was his sacrifice to decency; in a town of such limited social life an affair of this sort would become known at once. Morain was an attentive and jealous husband. If he harbored as much as one single suspicion, Leclair's own future would be hopelessly compromised. That cold, strong man, so firm and broad of shoulder, would be difficult to deceive. It was hard to imagine him being affectionate, but Leclair who knew the household, had no doubts on that score.

His imagination pictured the foundry-master bending his flowing grey moustache over Renée's graceful neck, caressing her with his hands, his ruddy visage congested with desire, and the picture caused him a pang. Leclair, in his own imagination, was always the voluptuary who desires no more of love than its physical concomitants. But in the past the search had brought him more pain than delight, and his most glorious hours had been poisoned with a subtle venom.

He had arrived at Ronceraies.

It was a beautiful place, situated about a league from the steel-mills and outside the agglomeration of workmen's homes.

Morain had acquired it from his predecessor, Deram, after having encompassed the ruin of the latter—by perfectly legal methods, of course. A little ark, running right down to the river-bank, surrounded the house. Out here the comparative rarity of the omnipresent factories and the fact that the other buildings were more widely spaced out, permitted one a view of a more distant horizon, but one which ended at last in the blue smoke of the mills of Lourches. Through the calm water of the Escaut plowed the tugs with their trains of loaded barges, or other barges drawn by tractors which moved along the bank.

In all this desert of steel and stone the little park with its shadowy vaults underneath the trees was one of the sweetest oases. Leclair who had a slight headache—his ears still beat with the sound of the hammer and his eyes were spotted by the too-brilliant glare of the heated metal—took a little walk before going up to the house, breathing with pleasure the moist air from which the river had washed the weight of dust and smoke.

In the smoking-room he found Selevine and Morain. A little later M. Fontaine came in. This scientist, thanks to the generosity of Morain, had been able to prepare a work on the microscopic structure of meteorites which he hoped would unlock the doors of the Institute for him. A solid friendship united him to the foundry-master.

A passionate lover of astronomy, Fontaine was particularly interested in the meteors whose fugitive brilliance animates our nights. He achieved a fine detachment from all that concerns this troubled globe of ours as he contemplated those sudden streaks of light in the black silence of the night-sky, or followed the trails of fire of the distant comets and the asteroids which the air destroys as a candle snuffs out insects—and he expressed this detachment by wearing an old-fashioned necktie of faded silk. An indulgent skeptic, he made no parade of his knowledge; as a matter of fact, he did not even believe in the science to which he gave his life, following it only as a kind of mental gymnastic, a means of diversion for a man on his way to the grave.

● He had a marked appreciation for Selevine's caustic spirit, and Morain never failed to invite the latter when the scientist was to call.

Always dressed in dark clothes that accentuated the pallor of his countenance, Selevine was more often silent than speaking. Nevertheless, when drawn into some scien-

tific controversy, or when anyone dared to deny one of the ideas that were his particular pets, he threw himself into the conversation with passionate ardor. His knowledge was immense, though badly ordered, and his imagination, though somewhat disciplined by the methodical German training he had received, often drew him out of the straight road of science into weird forests of fantasy. Morain, who at bottom thought him a barbarian, nevertheless appreciated his practical achievements at their full value.

In physics and above all, on their mathematical side, he had carried his studies far. A follower of Lubatchewsky and Riemann, familiar with the work of the non-Euclidean geometrists, he frequently carried his hearers with him out of the range of human perception and into the disconcerting regions of the fourth dimension; where the astronomer, in spite of his interest in things new and strange, always refused to follow. On such occasions a smile would play round Selevine's mouth. Then becoming severely practical, he would discuss social questions, denouncing the iniquity of the rich and the misery forced upon the workers by capitalistic society. He held with Tolstoi, that modern civilization was responsible for all the evils that weigh upon humanity.

Tonight he had engaged M. Fontaine in a discussion that both of them found extremely interesting; for Dr. Levysson and Breval had arrived and it was necessary to twice send the butler to remind the disputants that dinner was served.

The mistress of the house came down and all went to the table.

Little lamps with silk shades shed their soft light over the linen. The golden rays touched the hair of the young matron and caressed the pure and refined lines of her bare arms.

She did the honors of the table and listened, with a far-away smile, to the compliments of her neighbors, the doctor, who rather fancied himself as a connoisseur of wine and women, and Breval, a well known painter, just back from a trip to the United States.

The conversation at the beginning of the dinner touched on this subject and that but the inevitable shop-talk came up at last.

Meanwhile Leclair was watching, with some annoyance, as Dr. Levysson deployed all the graces of an old beau, bending toward his charming hostess a face already flushed with the first libations. A clang of silver woke the engineer from his reverie. He heard M. Fontaine saying:

"My dear Selevine, the explanation you give for the peculiarities in your steels seems to me extremely specious."

"Do you know, Levysson," said Morain, "you have a singular neighbor. I presented Selevine to you as an engineer and the head of my laboratories, but he is less an engineer than a philosopher, and less a philosopher than a Nihilist. He has curious views on the subject of matter and some of his notions, though they are based on a solid mathematical foundation, hark back to the alchemists of the middle ages. He attributes to metals a kind of life—slower than our own, but possessing a dumb sense of feeling and a kind of conscience. In fact he thinks he sees in metal all the manifestations that characterize organized beings, but in a rudimentary state. What do you think about that?"

The doctor wiped his lips and replied with an air of profundity:

"Yes. A good many physicians reason along these lines these days. They have been struck by certain phenomena common to metallic matter and the living cell. I think the analogy is far-fetched; after all it is no more than a play on words."

"A play on words!" exclaimed Morain. "Don't you know that the crystal is the specific form of matter, the mineral germ, so to speak, which is born, reproduces itself, and finally dies?"

The doctor shook his head. M. Fontaine, the thorough-going materialist, added another argument.

"Boses has demonstrated that certain properties which were formerly believed the exclusive characteristics of living matter are also possessed by metals. Take the fatigue of steel, for instance, and the result of the application of certain depressants, drugs and poisons. Belaieff, a compatriot of Selevine's, was the first to speak of the inherited characteristics of metals."

"You are right," agreed the Russian. "The mechanical performance of a metal depends upon its history and the states it has already passed through. You can see it in the case of certain carbon-steels, made of scrap which has been melted down, and which have already left behind them five to ten generations of 'metallic entity.' Chemically identical to the same steels made with fresh metals, they are more capricious in performance; they undergo spontaneous evolutions. The explanation I offer of the breakage of those machines is not at all incredible in this light."

"It's possible," approved the foundry-master, "but I fear that these conversations on mechanics are boring M. Breval."

The painter protested. "These questions have a good deal of technical interest."

● "And considerable practical importance," replied Morain. "Nothing that concerns iron should really leave us indifferent. Isn't it the primordial element, and in a sense armament of modern civilization? No one really considers how much industry can modify the habits, the life and the development of a race. It is necessary for centuries to pass before the difference is really appreciated. In a few hundred years we will know, for the first time, how much steel, for example, has influenced human evolution, and they will speak of our age as the age of steel as we refer to the Stone Age or the Bronze Age."

"I hope," put in Levysson, "that our distant grand-nephews won't judge us solely by the uses we make of a single metal, no matter how essential it is. You see too many things from the metallurgist's point of view, my dear Morain. What the devil! There are more important things in the world. The intelligence of man—"

"The intelligence of man," interrupted M. Fontaine, "Is specifically a manufacturing intelligence. It has no occupation but the creation of artificial organs which complete and supply the deficiencies of the human machine which is the means of support for the intelligence and which furnishes it with its means of action. The whole superiority of man over the animal, all the effort of the human mind, past and present, is comprehended in this—to invent and construct tools and machines. It is only by means of mat-

ter that the superior forms of life can conduct the battle with matter, and this conflict will go on forever."

There was a moment of silence; the clink of silver was audible; the flowers on the table seemed to exhale a heavier perfume and the thoughts of those present to become more active.

Selevine, who seemed to be regarding the glass in which the bubbles coursed through his golden wine, with the most intense attention, lifted his head.

"Why is it necessary to believe that the human mind will always need instruments and intermediaries to manifest itself?" he asked. "Who knows what the future holds for us? Whether in place of multiplying the mechanisms interposed between our bodies and the world we will not simplify and do away with them? There are in man certain mental energies which he has failed to use to the best advantage only because of infirmities in his own nature; or rather, because he has always had some useful and docile instrument at hand, he has continued to do the easiest thing—that is, something industrial."

"But what else could he do?" demanded Breval in astonishment.

"I mean to say that if evolution had taken a different course, human activity would take place in the psychic domain instead of the kingdom of matter."

"I am curious to know what would have been the result of such a state of affairs."

Selevine smiled.

"To make that out we would need a different type of mind; our mentalities, once they get beyond the concrete, flop about like fish out of water."

"Dreams, dreams," said M. Fontaine, wiping his glasses. "The future belongs to the machine. The absolute monarchy of metal is at hand. Even art must bow to it or perish."

The dinner had reached its end.

Before his luxuriously appointed table Morain began to tell of his difficult early days with obvious pleasure, but Levyason, though pressed to stay with him for a cigar, made for the smoking room.

In a corner of the salon Leclair was telling Mme. Morain of episodes of his Moroccan experience. Two years before he had been engaged in the construction of a hydraulic plant on the Oum-er-Rabis, where they had placed him in charge of the native labor gangs. He had not liked it at the time, but from a distance the memory was pleasant.

"I remember," he said, "an Arab cafe with painted rooms and a court paved with white stones. The daughter of the proprietor poured us iced liqueurs and burning-hot coffee. Her fingers were painted carmine, she was covered with cheap jewelry and her arms were bare. She received all the compliments addressed to her by lowering remarkably thick eyelashes over very black eyes. We all fell in love with her, but she was hunting for big game and our modest engineers' incomes were not sufficient to offer any temptation.

"I understand how you can be homesick. We can't offer you any such unusual diversions here."

Leclair became more cheerful.

"The Orient has a definite flavor, which it is difficult to forget. That's a trite remark, but a true one. At the beginning of my stay here, I was tormented with regrets, saddened by the ugliness of things, then I became reconciled to Denain. Your presence had a good deal to do with this change of attitude. No, don't smile, it's no more than the truth. You can't know how much your friendship represents to an orphan and wanderer like myself."

"Then come to see us oftener. Your father was my husband's best friend; is it necessary to remind you that you are a friend of the family? The work in the factory interests you?"

"Certainly."

"You're on good terms with Selevine now?"

"Oh, he's becoming humanized. At first, he seems a difficult man to figure out, but in time one finds agreeable spots in him. He is subject to savage fits which he tries to conceal under an air of timidity. He is an inspired engineer who writes poetry in figures without knowing that he does it. A rare specimen."

"His work has certainly not hurt the factory."

"But am I mistaken in thinking he rather likes you?"

Mme. Morain burst into laughter:

"Oh, what an idea!"

She was still laughing when her husband came back from the billiard-room with Levyssen. The doctor, who had won the game, poured into a glass a generous supply of a liqueur, a species of medicine with which he was accustomed to aid the functions of an already excellent digestion. Then all four rejoined Selevine and M. Fontaine. The latter was saying:

"No, no, old man, I don't believe that. You will never escape from the laws of life which demand the bad as well as the good, pain as well as joy and the triumph of the strong over the weak.

"Society, taken as a mass, is a vast plastic organism, whose structure depends, like that of any living body, on the interplay of its own elements and the exterior forces. It is a human grouping which is trying to realize, by means of the methods which it finds least repugnant, the obscure destinies of the race. Its internal logic cannot contradict the laws of economic evolution. It is organized according to the conditions peculiar to the age. In such a manner as to produce an equilibrium among its diverse forces."

CHAPTER IV

A Night Shift

● At a single bound the elevator carried Leclair to the top floor of the factory. There were concentrated all the offices and mechanical departments. Little box-like rooms opened on a corridor. He entered a door and found himself in a room imprinted with the indefinable ugliness which always surrounds the Frenchman at sedentary labor. Around the walls were graphs and tables of calculations. A grey day was reflected gloomily from the wall of a neighboring building through the dirty windows.

He got the current affairs of the day out of the way, ran through the letters on the table, and heard the reports of the foremen.

Martin, the chief puddler drew his attention to the bad quality of the pigs from the last run. They gave steels which did not seem to temper well. Short, squat, his rough skin worn to a file-like texture, nearly totally deafened from living constantly where no voice could be heard above that of the metal, Martin had, for long years, stirred the blazing pools of metal with his drawing-bar and could tell the temperature of the mass by visual ob-

servation alone as he scrutinized it through half-closed eyes.

He was continually "kicking" about the modern progress which reduced human initiative to a cipher, substituting mechanical operations for careful work. The engineer, aware of his point of view, smiled at his laborious explanations.

When he went down to the shops, he found the department heads, momentarily idle because of the interruption of current, discussing the accident of the day before.

The event was ordinary enough in itself, but had been accompanied by certain circumstances that aroused general interest. There was a slight feeling of disorder throughout the factory, as though discipline had given way at some point, a feeling strong enough to have been remarked by a stranger to the place.

At bottom, most of the men, in the innocence of their hearts, were glad of this interruption in the daily toil. At the engineers' table there had been more drinking than usual, that was all. If the spectacle of sudden accidental death can afflict us by calling attention to the common destiny of mortals, on the other hand it augments the pleasure of our existence, our precious existence, to know that danger has struck someone else.

Breaking off a peroration he was delivering in the midst of a group, Pillot approached Leclair and interrogated him in a nasal voice:

"Have you seen Morain? Is it true that he knows who did it?"

"Don't joke," put in Valles, a dry little man with a dark skin and black, quick eyes.

"Just the same," replied the other, "there are animals around here quite capable of putting their machines out of order in the most malicious way. Choleur spotted two of them the other day. Communists, they called themselves. They were vowing vengance as they left."

"He's a hard-boiled man, that Choleur."

"Not at all," protested Pillot, "only just. Revolutionary propaganda here would upset the whole works at a time like this. Over at Anzin, they're still getting out from under the results of the last strike and the lock-out that went with it."

"It's possible," said Valles, "but what does that prove? When you make an accusation like that you ought to base it on absolute facts. Until there's proof to the contrary I refuse to admit that it was done on purpose."

"Well, these repeated accidents . . ." said Pillot, his clown-like face wrinkled by the effort to think. "And Morain taking every word that goggle-eyed pope in the laboratory says as an article of faith. Everybody admires what he doesn't understand, and Selevine has the gift of complicating the most simple things and being ignorant with profundity."

"True. Your mistakes are so simple and obvious that they couldn't hide behind a mountain. When you go wrong you do it with a sort of terrible precision.

"You know, there is a reserve series of extra load fuses for triple pressures. It has never come into use but once before, and it's extremely difficult to bring it into use, even when you're trying. Well, our Pillot here got it at the very first effort and blew out all the fuses. Out of a hundred possible combinations he hit the worst one right at the start. Isn't that wonderful?"

The group laughed. Valles kept on pitilessly.

"Marvelous! The persistence with which you manage to make mistakes in defiance of all the laws of probability shows a talent, which is really remarkable, even if it does more work in the reverse direction."

"But keeping the alternators isn't Pillot's job," remarked Leclair.

"Somebody had to take Benoit's place and our friend who seizes on every occasion to demonstrate his universal competence, offered his services."

"How's Benoit coming on?"

"Done for," replied Valles simply.

There was a little silence. Leclair recalled the scene; the man stretched out, face downward, one twisted foot escaped from his shoe. Julien, his face agonized, kept repeating in a broken voice, "It wasn't my fault. I started the motor up, just as usual, and then, all at once—" Benoit, the wounded man, was screaming . . . He had understood everything when he saw the damaged wall, the roof punctured by the explosion of the casting. Women had rushed in from the neighboring street; pressing around the victims as they were carried out, curious over the sight of the blood, deaf to all remonstrances.

● Selevine had arrived, quickly followed by Leclair. His ordinarily pale face had taken on a tint almost apoplectic. Julien explained that he had started the big compound just as usual. The pressure was good, the governor functioning perfectly. As to the load, it was limited to the task of pulling the alternators at the empty. The machine had worked up to its normal speed, when suddenly something snapped. With a strident scream a volley of iron had descended on the men. Fournier had been killed on the spot and Julien had found himself flat on his back, alive only through a miracle.

Lefevre seemed struck dumb. His lower lip hung limp. He took it between two fingers and in twisting it, seemed to recover a portion of his faculties. "Now, look here, you must have run it at over the regulation speed. You had a drink or two, didn't you? Naturally, it wasn't your fault. You all say that. Well, we'll see!"

But the registering devices told the story of a normal running of the apparatus. He tapped the glasses over the registering drums. "The devil!" he murmured, "here's a thin undulating line, and there's one with a sharp break. The accident unquestionably came at exactly nine o'clock. I should have been here." A sudden flare of anger lit up the tiny eyes in the midst of their pockets of fat in the pudgy face.

"Did you think of verifying the pressure? No! I don't doubt it. You were drunk. Why didn't you let me know about it immediately? You don't know—you never know anything. Are you the chief mechanic or not? Stick around, you're going to see something!"

Hurrying to the director's office he reported to Morain.

"Nothing but an accident. Too bad, yes. But like all the accidents of no real consequence. The turbine will be repaired in three days. I have looked into the matter, it was due to the human factor again. Bad management, negligence on the part of Julien. That fellow drinks. I'll get things in order all right. Don't worry about that."

Later Leclair had learned from Lefevre that the percentage of faulty manufactured articles from the factory had tripled, and that three thousand pigs of iron had just been refused by the Archer firm. Nevertheless the superintendent refused to see any connection between these occurrences.

"The things they're kicking about," he explained, "were turned out by good workmen, men I'll guarantee personally. You know, for some time, the production has not been as good as we would like. Is it due to the poor quality of the raw material or bad workmanship? I don't know. Anyway, I promise you not to let any wild stories like those you've just been telling me get around. There's no use in magnifying things."

. . . "Lefevre is too obstinate to look at the truth," remarked Pillot a, a little later. "They've got Tullier to do the investigating. If he finds anything I deserve to be hung. You have never seen him? Imagine a kind of deformed giant with a little head shaped like a rabbit's. He has a mind full of fur; an idiot by construction."

And leaping from one subject to another, he went on:

"Have you ever seen Mme. Morain? She went across the court just now. Elegant, and boy—what a figure! And dressed! She was going to see Benoit's wife over at the Cooperative. Selevine was with her, naturally. He has all the chances in the world, that chap."

"Maybe he deserves them."

"Phooey! He'll never make the boss a cuckold; anyway, someone else has beat him to it. As for Selevine, I'd let him take my sister out. You know, with women—"

● Selevine halted before an electrical machine. His experienced ear had caught an anomaly in its rhythm, without his intelligence being able to assign any definite reason for this feeling. From its heart of copper and iron, energy flowed along the cables like some mysterious blood-stream. On a marble panel nearby were circular dials where needles told the story of this passage of disciplined forces.

By contrast the depths of the foundry were sunk in impenetrable shadows. Selevine's eyes took in the details of a Decauville track, and then gradually accustomed themselves to the obscurity into which he was gazing. Along the ground floor were ranges of completed castings, of raw minerals, of slag and vitrified cinders. In the storeroom piles of bar steel gathered coal-dust. An indefinable odor, the production of chemical reaction and mineral ferments, filled the place. Monsters undergoing their period of gestation were there, larval forms drawn from the depths of the earth, waiting for the arrival of the creative forces which would bring them to life.

A pyrometric laboratory had been reserved for his work. He rejoiced over the prospect of laboring there without disturbance. On the blackboard half effaced figures deployed their columns of arabesques. The calcined stub of his pipe was bitter on his lips. His thoughts became extraordinarily clear, and a sudden enthusiasm seized upon him. For a little while he busied himself with various crucibles, imagined momentarily that he had recovered his happy vein of a few days before. But he tired rapidly, and turned to the transcription of a complex chemical reaction for a respite. In vain; the figures would not come, and sleep clutched at his brain.

In accordance with Morain's wishes he had taken over the duty of superintending the factory for the night; there was a steel contract to be fulfilled, with stiff penalties attached to it. And although the broken machines had been replaced production had fallen off to such a point lately that it had become necessary to work day and night. Luckily, he enjoyed night work. He pursued his studies to the hour of false dawn and then, pressing his face against the window, he had seen the last lights wink out, and had returned to his books with renewed energy, delighted to find his mental powers so clear, his intelligence so active, in the midst of a sleeping world. Such hours are rich with meditation.

He took a few quick steps to and fro to warm himself. They had forgotten to light up the gas radiators, and a glacial humidity mounted from the earth. A little shiver went through him, and he felt a tightened sensation in his chest. The memory of the pain it awoke had the effect of discouraging him.

He had strained his constitution too far these last months and his body demanded a rest. With some bitterness he remembered his sickly adolescence when a similar lassitude had paralyzed his efforts. The desire for a kind of animal repose swept over him; he remembered the convalescent hospital where he had spent a good deal of his time. It was a place of roses without savor bounded by a horizon of low hills.

A bell rang. He experienced a certain annoyance. "That animal of a Martin!" he thought. "If he'd only just once get out of his difficulties by himself." He hung up the telephone, but his reverie was broken and he decided to go out.

The events of two days ago still bothered the men, causing them to gather in little groups of two and three and make an elaborate pretence of being busy when Selevine entered the shop. Someone explained that the failure of the power kept them from doing anything, the supply of current being so low that the tools refused to bite when they engaged the whirling masses of metal.

Something had gone wrong with the main dynamo installation. It vibrated with lessened speed in its cage of iron beneath the glare of a screened light. The bronze fittings, the mass of wires, the buzzing moving parts, threw off little sparkles of light. An electrician, in overalls and wooden shoes, was already at work, but his little tricks did not seem to be having their usual success. He changed the carbons, verified the contact points, went to examine the dials and returned in a meditative mood. Selevine had the smoking dynamo stopped, and hooked up an emergency power unit.

The electric furnace also was not working well, and had to be examined before he could return to his office.

At three o'clock he returned to the shop. Two arc lights were burning feverishly as though insects with flame-like wings had been captured in their globes, and the silence of the night was disturbed by a medley of sounds. Veiled flood-lights illuminated a corner of a tower, a polished, cylindrical surface; a man with a sharp face was ordering mechanics about. Someone shuffled past on silent feet, an oil-can in his hand. A comet-like trail of stars issued from a grinding machine at work on some instrument.

The engineer seated himself in the little look-out post belonging to the foreman. By lifting his eyes he could see the stars through the windows, like another trail of fire-dust, punctuating the vault of heaven. Out there the gods were dead and only an immense nothingness filled the void of cold and silence. "No help from there; the eternal desert of space surrounds this globe on all sides. This globe where Nature cannot contemplate her own works without

detestation. The diamonded constellations, which had seen man rise from the primeval slime and would yet see him pass, laugh at the obstinate ant-labors of the insect beneath his cage of glass. His victory, if he is to win a victory, must be gained in the space of a breath. Oh, foolish hopes, derisory vanity! So much trouble, so much refined self-torture to end in—nothing. Ah, better than thus to deceive oneself, it were to live like an animal."

● Sometimes Selevine imagined that in the industrial city which surrounded him he saw only the matrix from which the future world would rise. He admired the restless energy, the indomitable will of man, pursuing his dream of pride and grandeur amid the terrors of a quaking planet . . . . but more often the futility of all effort was apparent.

The night had reached that magic hour when human thought ceases to be chained to the tired body and rises, diver-like to plunge into pools of morose reverie. The movements of the men became less energetic, the air heavy with odors and smoke; sleep weighted the eyelids. It was not yet day, but its approach could be sensed through certain almost imperceptible signs. A leaden light mingled with the night and turned the lamps pale; the cold of dawn reached out for tiring bodies.

At five o'clock in the morning the first gang prepared to leave.

"A day will come," thought Selevine, "when the last tree will perish on an earth sterilized by the efforts of the human race. Then, in place of flowers and forests, we shall see nothing but steely architecture, lifting its towers, swinging its enormous vertebrae and complicated skeletons across the horizon.

"Rigid and sharp of outline, in imitation of his works man will live an existence regulated by immutable laws in cities of laborious insects. Thus the world will stifle in the tightening grip of metal and power. Nothing unforeseen, no sentiment, no passion—the privileges of more easy ages—will exist and pity will become a far-away dream. The queer-machine will multiply its activity among geometrical decorations and cities without warmth. And there will remain to man only enough intelligence to realize that he has sacrificed his youth and become the slave of machinery of his own invention.

"Tossed this way and that by contradictory impulses, branded with the mark of the beast, he has escaped from instinct only to become the automaton of a force worse than instinct. For this is the vicious circle in which humanity must turn forever, while dreaming of limpid skies."

Suddenly jets of steam leaped from the roofs of the factories and out of a thousand throats issued strident whistles. The distance woke to a chorus of metallic cries. It seemed to Selevine that here he heard the true voice of the city, plaintive and heart-rending.

It always cried out thus amid the tenderness of the dawn, at the hour when men, drawn from forgetfulness, hesitated on the threshold of the new day. It was a denial of his aspiration toward extinction as an escape from a burden too great to be borne. Day followed day; the same men went through the same gestures without conviction and toiled in the monotonous round in which their sons would toil.

The powerful voices, meanwhile, glorified the industry of iron and fire as it extended its empire over the earth, proclaiming its pitiless law that the efforts of men to escape were vain and would break against the very instruments he had designed for his liberation.

CHAPTER V

A New Accident

● Two months had passed. The castings from the Morain company were showing so many defects that a number of clients, in spite of reduced prices and payments made in advance, were cancelling their orders. The government was more indulgent, but the necessary oiling of official channels threatened to absorb all the profits.

After a careful investigation, Morain had reached the conclusion that he was the victim of some sort of revolutionary plot in which the personnel of his factory had a part, and with some particular object in view.

Guards were placed in the various departments and a sleepless vigil was kept. But it was all in vain.

More than the destruction itself the mystery of how it had been brought about disturbed Morain. Although he had studied the weakened sections under Selevine's guidance with the most minute attention, he had failed to acquire any clear idea of the method that would produce such results. These modifications of the texture of the metal itself, these dry, dusty knots encysted in the mass, some of them imperceptible to the naked eye and others as big as walnuts; these cinder-like stains, sometimes black and sometimes blue, running through the steel, seemed to have been produced by a process unknown to modern science.

A certain intuition suggested to him that he was in the presence of facts to which the classical formulae of the engineer could not be applied, but he repulsed this idea as the product of an overheated imagination and raged through the same investigations for the hundredth time.

In despair, he again appealed to the authorities to give him protection. The earlier inquiry by the police having produced no result, Inspector Tullier did not wish to bother with the matter any further. He sent two detectives along. Using the ordinary police methods, they succeeded in actually catching a man in the act of sabotage, but when Morain had interrogated the frightened little fellow with troubled eyes sodden with alcohol, he became convinced that the serious troubles in the factory had certainly never originated with such a rat.

The arrest of the workman made a good deal of talk in the city, nevertheless, and at the factory itself there were some who defended his actions. Lefevre, getting wind of this spirit, drew up a list of the workmen who were affiliated with extremist political parties. A few were dismissed. Rewards were offered for tale-bearing and a flood of anonymous letters poured into the office. One of them denounced Julien Laval in the most energetic terms.

A search-warrant resulted in the discovery of numerous pieces of propaganda and letters from different revolutionary groups at his house. Although he had a fairish reputation in the factory up to this time, he was instantly dismissed, and ten others with him. The workers sent a delegation to plead for them, but Morain's decision was inflexible.

Marked down as an agitator, Laval could find no other job in the district. Fanny, in a sudden access of sympathy

and passion for her lover, turned over most of her salary to him.

He trailed from saloon to saloon throughout Denain, finding in alcohol a consolation for his sorrows, and delivering tirades against his former employer. From time to time he would have fits of anger; in this mood he beat his mistress with enthusiasm. But Fanny, weeping, only loved him all the more for it.

Selecting a time when Leclair was alone in the laboratory she begged him to intercede for her lover, but the engineer, annoyed by her pleading, repulsed her with some rudeness.

"Julien," she said to him, "is incapable of a really bad action. He's just weak, that's all. His only fault has been that he listened to that Selevine. He's the one who's really at the bottom of the whole business. You'll tell Monsieur Morain, won't you? . . . Monsieur Raymond."

"Well?"

"You weren't always like this. Someone's been telling you things about me."

"But—"

"I knew it! And naturally, you believed every word they said. You're as blind as you can be and the others are just as bad. When I think how they look all over for the guilty person without the idea ever occurring to them that . . . well, they ought to look a little nearer home, that's all."

"What are you trying to say?"

"You wouldn't believe me anyway. What's the use? Listen, Monsieur Raymond. I've been watching for a long while . . . Nobody ever pays any attention to me, naturally. I've been watching that Russian; yes, Selevine. Please don't go—yet. I must tell you about this.

"I've kept it quiet for a long while. I'm only an ignorant woman, but I have eyes like the rest of you and I know how to use them. In the evening after the shop closes up, I've seen him go all around the machines. He'd walk up to them, and poke into them here and there with those long skeleton fingers of his. I've even felt those fingers on me, yes on my body. But I'm not the kind of girl that gives herself to every man that comes along. I'm scared of that anarchist, besides. He got Julien fired, and he'll do for all of us yet. Tell Monsieur Morain about it before it's too late."

● She stamped her foot.

"Ah, if I could only persuade you to put the others on their guard. But he's got himself into everyone's confidence. He's bewitched everybody in the world, even Monsieur Morain and his wife. The damned foreigner!"

Fanny looked up and then came closer to Leclair, looking into his eyes. A burst of enraged merriment filled her throat, and she said rapidly:

"Oh, you didn't know that? Before you came, Mme. Morain was in the laboratory quite frequently. They worked together no doubt—it was really charming! You really shouldn't have come to interrupt their little idyll."

"You're a fool."

He sent her away, reproaching himself for having listened to such silly chatter.

Nevertheless it made a considerable impression on his mind. Certain little things to which he had never paid any attention, oddities in Selevine's conduct, came back to his memory. The surly fits to which the Russian was subject irritated him more than ever, although he could place no definite reason for it. He avoided speaking to him aside from the needs of the daily task.

* * * *

Toward the middle of December the pace of events became more rapid. The latho-men had to stop work. Their tools no longer bit in spite of frequent grinding. With the planes and milling machines it was the same story. Then, following the trouble with the special alloys of the machine tools, the machines themselves; the castings of their bases were attacked.

A leprosy seemed to run through the compact tissues.

The steel machines, one by one, got themselves out of order. The workmen hesitated to approach those still in operating condition, fearing to have them suddenly explode into a hundred murderous fragments under their hands.

Pillot came to Lefevre one day with the news that two mechanics had refused to make an urgently needed repair on a motor while it was in operation.

"Go do it yourself," said Lefevre.

"Mm—m . . . It isn't as though there were any real danger . . . for men who know how to do the job."

Lefevre looked at him sidelong.

"It's up to the heads to set the example, Monsieur Pillot. We can't have any cowards around here."

The next day Pillot turned in his resignation and two other engineers, Valles and Gallois, followed his example —for the good of the profession. Their departure made a bad impression in the shop and a series of alarming rumors ran through it like wildfire.

The more timorous spirits would have left also, but the fear of being without work detained them. Foreseeing the approaching ruin of the firm and a long period of unemployment before them, they told tales of woe to anyone who would hear them.

A few old grumblers, who had spent their lives over the benches, regretted the loss of the familiar machines. Others rejoiced without knowing why, nudging and winking at each other when the owner of the factory passed by, morose and silent.

Morain was an oak. In the course of his career he had been through numberless conflicts and surmounted difficulties out of which his character, so far from bending, emerged with renewed strength. But the mystery with which he had been grappling, this battle against unseen forces, was bringing him down fast.

Exhausted by work, he found the cares of the day disturbing his nights as well. The energy to resist the suggestions of fear was somehow lacking.

What did they want of him anyway? To make him shut up his shops and turn more than a thousand workmen into the street? Could he do anything to take the edge from this vindictive hatred? If at least he could have counted on the fidelity of the engineers! But suspicion and jealousy divided even their ranks. Lefevre, with his self-sufficiency, his sterile activity, was futile. Choleur's brutality became accentuated at the very moment when patience and discretion were most needed, and upset even his own subordinates with his suspicion and clumsy surveillances. Selevine's science was at fault; he avoided the director and spent all his time in the laboratory, while Raymond Leclair was incapable of accomplishing anything that demanded the slightest concentration, and did nothing but think up the wildest of ideas.

For some time, in fact, Leclair had suffered from some indefinite disease of the spirit that put a term to his activity. Incessant headaches seemed to press on his temples. He had noted a slight red rash on his hands, and had attributed it to the influence of the furnaces to which he must have come too near.

As though in a constant dream he heard the confused murmur of the factory, the movement of the fires held him spellbound and a kind of stupor sapped his powers.

● One evening he was crossing the department where the first accidents had taken place. It had been closed off to the workmen. Two electric lights burned feebly, and as luck would have it, both went out at the moment when Leclair was passing through. Certain machines glittered feebly. Tiny luminous specks starred the granulated surfaces of the breaks, while the polished surfaces seemed to be reflecting light from some invisible source. The engineer made a mental comparison with the fox-fires in certain marshes. He thought at first that he was the victim of some optical illusion, some curious trick of reflection, but at a distance from the windows and in the shadow of his cupped hands, the luminescence persisted. It was present in every dark corner of the room.

It was seven in the evening.

The grilled windows held rectangles of indigo and the moribund lights flashed redly.

A dull noise could be heard in the distance but all else was silence. Leclair felt somewhat unbalanced by this unusual quiet.

Certain facts he had witnessed now took on a new significance. They were linked by curious similarities under the shadow of this remarkable phenomenon. Invisible currents, radiating from some impending catastrophe, seemed to have perverted the instincts of the animals about the place. Rats had been seen leaving the basement where iron was stored and invading the upper floors. Lights had appeared in the store-room at night.

His imaginative eyes seemed to see in the forms of the machines about him the vague shapes of monsters ready to tear him to pieces.

He felt the weight of his recent lassitude. His head whirled. Nevertheless he continued toward the neighboring department where a steam engine was housed. About him the forms of heavy levers made fantastic patterns in the gloom.

A faint sound was audible.

It seemed to come from one who was sick or tortured. His heart beating rapidly, Leclair listened; but all was silent again.

Turning to go, he heard the stifled cry once more. It seemed to him that it came from the passage that ran along beside the big engine. Someone hurt . . .

By means of the little ladder placed there for the purpose the engineer reached the base of the machine.

The uncertain light of a single bulb projected long moving shadows. At the bottom of the narrow space lay a man, his face to the ground.

Leclair recognised the form of Selevine.

He seemed to have lost consciousness. Two fingers' breadth from his head the massive fly-wheel was moving and the connecting rods moved back and forth like sabres to the rhythm of the piston.

Not without difficulty, Leclair succeeded in moving him from his dangerous position and ran to get help. The quitting whistle had long since sounded, and the infirmary was empty, but he managed to find a first-aid kit and hastened back.

His head moving feebly from side to side, his lips colorless, the Russian had half-opened his eyes and was breathing with difficulty.

A woman brought a basin of water and washed the bloody head. Behind her appeared two or three employees, held late at the factory for some reason or other. Finally an ambulance arrived and took away the wounded engineer.

A little later Leclair was explaining to M. Morain.

"Some moving part of the engine must have hit him. The floor is very oily and uneven, and he must have slipped."

"But what was he doing there at such an hour?"

Leclair hesitated. A suspicion rose within him. Finally he told part of his conversation with Fanny. He had attached no importance to it at first, but it was hard to overlook certain suspicious facts.

"Oh, that's absurd!" exclaimed Morain. "The more I think about it the more any idea of human intervention in the phenomena we have witnessed seems infantile. There are breakages of machines and tools over at the Richard factory too. Barrois can't see anything in them but a series of fortuitous accidents. It's impossible. But if they were found to have a similar origin, what would you say?"

"But how can anyone conceive—?"

"Oh, it will all clear up and quite soon, I'm convinced. Don't make rash judgments, my boy, above all when it comes to accusing people of things like that."

Raymond reddened and was silent.

CHAPTER VI

The Conspirators Meet

● The next morning Morain went over to Levysson's clinic where Selevine had been installed. In a bed, with his head swathed in bandages, the engineer was reposing with closed eyes.

The doctor had not yet been able to make a diagnosis of his patient's condition, and was troubled by the coma that had followed the delirium of the night before. He told how, at the height of his fever, the injured man had cried out against the ghosts produced by his own fevered brain . . . "It is the death of iron!" he had cried in a hoarse voice. "We must stop it . . . too late, everything's going to hell . . . Everything's done for!" Trying to rise from his bed, his eyes fixed and dilated, he seemed to see, God knows what frightful spectacle before him.

"I had to use an opiate," said Levysson. "The poor chap was much impressed by the events that have taken place at the factory, and his delirium took this particular form accordingly. As a matter of fact such a series of accidents has never happened before. There have been bad breaks at the Richard and at the General Tool Co.'s factories and more recently at Archer's. My clinic is full of injured workmen. I have heard that it's all due to an organized program of intimidation directed against the heads of the industry. What do you think? The authorities have at last decided to suppress the *'Populaire.'** There's a war-

*The Populaire is the French communist newspaper.

rant out for Totti. Naturally the metal workers' union is protesting."

"My dear man, I must get along," Morain interrupted with a touch of asperity. "Let me know how Selevine comes along, I beg you."

Getting into his auto, he had himself driven back to the factory.

As soon as he arrived he encountered Lefevre wearing an expression of complete despair. The giant overhead crane which served the Bessemer converters was out of order; one of the tracks on which it moved had broken under its wheels.

When he reached the shop the mechanics had already put some shoring under the apparatus, but the crane bowed sidewise and threatened to fall at any moment.

"We'll have to get it across the gap. Ah, the motor is wedged. But then—! Chouleur! Where is Chouleur?" cried Morain.

And turning round he almost hurtled into a workman and then perceived for the first time that the others were massed around in a semicircle, their noses turned upward.

"Clear out you! Come on, get going."

The group dispersed, giving way to the breakdown gang. With jacks and pinch bars, some climbed up to where the overhead track ran, while others rigged a sort of emergency scaffolding and set up blocks and tackles. A dozen hands seized a rope. Their rhythmic efforts made the muscles on their powerful arms bulge out and the veins in their necks glowed blue. Their chests expanded but the great mass, jammed in its position, refused to move.

Therefore, at all costs, it was necessary to take the weight off the supports.

Lefevre proposed the establishment of a temporary connection with the roof-girders. Would they be strong enough? Everybody discussed the question together. Morain mopped a moist forehead, hesitated and calculating, apprehending the imminent fall of the machine. A few minutes more then nothing could stop it.

In his brain the contending forces ranged themselves in ordered sequences. He calculated their strength and their direction, the resistance of the supports.

With a gesture, he called for silence.

"Chouleur, come here! We're going to turn over the motor of the crane after hitching chains to one of the gallery columns. Do you understand? The crane will haul itself up on its own chain. By wedging it as it moves we can make it pivot in the right direction."

"It's risky!"

"No other way out. Quick, one of you men, get up there and make the connections. Winter!"

"It's—a—"

"You're scared? Marchal, up with you, my boy."

The person addressed, an agile adolescent, peeled off his vest, ran rapidly up the steep ladder, and working along a girder, dropped to the deck of the crane. He moved with caution at first, then became absorbed in his work. The windlassing arrangement was established. Something clanged; there was a blue spark.

Marchal slid alertly to the ground where his companions had already placed the moorings and wedges. Pinch-bars at hand they stood ready.

Chouleur threw in the current. The motor turned jerkily and the chains tightened. There was a screech of metal. Visibly, the crane moved.

It seemed to Morain that one of the wheels at the back had suddenly flexed on its axle. A fog filled with luminous points filled his vision, he could not breathe. With all his will-power he willed against the fall of the menacing mass. Without being conscious of it a cry was wrung from his dry throat.

"Stop!"

● Someone swore fervently; then for an instant there was an electric pause, an unstable and menacing silence. Chouleur lifted his head and stood like a man enchanted.

"Look out! Stop!" cried the men, flowing like a tide around Morain, carrying him with them, bumping into each other.

In the middle of the emptied space, a trembling seized one of the anchors. There was a crack, then an exasperated squeal of metal. Someone leaped awkwardly from above. The great crane began to slide. Girders and chains cracked apart, one after another, like threads. The distended links gave way with a clear, ringing sound.

And down it came! With a thunder that shook the great hall of the foundry, twenty tons of steel crashed to the ground, and from the dustcloud that rose round the wreck came cries, piteous appeals.

That blue thing there, under the mass of torn girders, could it be the broken body of a man? Morain did not want to look at it. But he saw with the greatest clearness what could have been done. His mind, as though unwilling to believe the evidence of his eyes, continued to work out a solution now become useless, when a sound made him look around. With a voiceless cry like that of a wounded beast a man was brandishing under his nose the crumpled remnant of a hand from which several fingers had been torn, and shouting at him.

"You dirty bitch! You did that!"

The man looked at the blood almost stupidly, then his pain coming home to him, he pawed at Morain's garments, his eyes wild, his lips foaming. Before anyone could intervene a hostile circle had formed around the owner of the factory.

Pushed, overwhelmed, he tried to make himself heard, but the tumult drowned his voice. He was menaced, insulted, from all sides. Nevertheless there were a few voices raised to defend him. Martin stood against the crowd, telling them to be calm, with his great rolling voice. Morain saw Lefevre, terror-stricken, crouching behind a machine. Chouleur brandished a wrench and shouted, "The first man who comes near me! The first . . ." and then suddenly collapsed as a bolt thrown from somewhere struck him squarely in the forehead.

The hostile circle tightened, clenched hands were lifted. A woman in a torn dress screamed imprecations. Morain recognized her and thought dumbly, "What, that old fool, too?" A hand tore at his coat, another struck him on the ear. "Ah, you pups, I'll make you pay for this." He thought of pitiless revenges he would inflict. There was a whistling sound, the smoke suddenly lifted, and the acrid odor of a fire-extinguisher reached his nostrils. He felt his strength give out. He was only a tired old man, in whom all sense of authority was dead.

But already hands were lifting him, others were brushing off his dirtied clothes. He perceived something like a softening of the wills hostile to his, a quick melting of their anger. Around him there were undecided move-

ments, the last effects of anger trying to keep itself alive. Employees were pouring from the neighborhood offices. Lefevre dragged himself to a telephone. Voices rose against the anonymous aggressors; everyone disclaiming responsibility. The rebellion died out suddenly and the old habit of obedience was reasserted.

A gendarme appeared, a revolver conspicuously belted to his hip.

Amid scenes of authority reborn, aid for the injured was organized.

Leaning on Leclair's shoulder, Morain left the building, unable to hear anything but the drum-like beating of his own heart.

"Leclair is right," thought Morain, "that luminescence came from the steel itself."

Crossing the laboratory, he pulled the curtains closer together and came back to look at the testing table. The atrocious vision of the man, crushed before his very eyes the day before, returned in the darkness, but he managed to dismiss it.

As a matter of fact, investigations into the cause of the mystery had until now been unmethodical and badly conducted. It was necessary to proceed with greatest care, verifying every step, to arrive at any definite conclusions. But who would have been able to keep his nerve and move calmly under such circumstances?

He examined the fragment of steel once more. Taken from one of the first machines to break down, it seemed to have been rubbed all over with phosphorous. The little dusty spots, the stains noted two months before, seemed to have multiplied. No treatment he knew of would produce such results in metal.

Morain felt that he had touched the heart of the problem and the excitement of the research man on the threshold of a great discovery gripped him. A confused idea that until now he had hardly formulated began to clarify itself in his mind.

The effects he had seen in his factory could not be classified with any known series of phenomena. They were the special results of some new type of energy acting on matter.

A certain emotion dried his throat, and he repeated in a low voice, and with lips that barely moved the words Selevine had pronounced in his delirium, "The malady. The death of iron."

● Yes, that was it! A contagion running through the agglomerations of steel and propagating itself from one piece of metal to another. His reason reeled before so incredible a conclusion.

Was he, too, becoming feverish? Clear-headed, and yet feeling himself the victim of some strange dream, he could not moderate the workings of his mind as it followed the facts to their logical conclusion.

The method of transmission was doubtless through some metallic dust, imperceptible crystallizations whose dimensions barely exceeded those of the germs which carry the diseases that attack living beings. These germs, attacking healthy metal would engender others of the same species, all radiating outward from the point where they struck.

Repeated shocks and vibration no doubt increased the effect, for it was in the machines subject to the greatest amount of vibration that the disease had operated most violently. Selevine, without discovering the true cause for the disease, had succeeded in explaining its progress.

Further observations reinforced this conviction. And curious to relate, the certainty that the trouble was not due to enemies but to physical causes, no matter how remarkable, had the result of reassuring the iron magnate.

After the brief bending of his will, now that the peril was known, he recovered all his energy. The man of steel felt that chance had thrown a new and fascinating study in his way; one that he might even turn to some practical advantage.

At least he could defend himself, save his factory, his fortune—his life's work. He made plans, felt himself imbued with new activity.

Forthwith, he summoned Lefevre and traced out for his benefit the main lines on which the struggle would be carried forward; specialists were to be retained for the cleaning up and renewal of the damaged machines; production was to be speeded up and thus, the alarmed rumors which threatened the credit of the company would be stilled.

The chief accountant submitted a series of calculations he had just drawn up. The losses were less serious than Morain had at first thought. He suggested turning the product of the Piennes mines over to the Regie of Azincourt before the quality of the mineral produced became generally recognized as bad, or else exchanging them against realizable coal properties as soon as possible.

The Archer firm would advance two million in credit, but only after an inquiry that could not fail to throw discredit on the factory. Meanwhile the exchange of properties could be carried through in secrecy.

After glancing over these proposals Morain resolved to see Mr. Barrois of the Archer firm and tell him of his new hypothesis. He considered him the best metallurgist he knew after Selevine.

As it was already past twelve and he was hungry, he dropped in at a little restaurant instead of going home for lunch.

The communists of the district met there most of the time. The proprietor, a man named Beutier, passed as one of the most ardent devotees of their party. As a matter of fact, he had certain discreet relations with the employers' organizations and passed valuable information along to them from time to time, not because he was really in favor of capitalism, but because of his wife, a good-looking woman who was extremely fond of jewelry, and whose virtue was in proportion to his presents made to her. He was regarded as a good fellow who treated the comrades frequently and extended credit freely. The comrades attracted by these advantages came to his place to assuage both their resentment against capitalist society and their thirst, while they talked over the Great Day of reprisals against the detested bourgeoisie.

Recognizing the foundry-master, Beutier led them into a little room at one side and waited on him personally. Through the crack in the door Morain could observe the bar-room. In front of the bar, and with their backs to him, a group of workmen were talking.

The nervousness, the uneasiness of these usually placid men struck him forcefully. A man from the Archer factory was reporting that a heavy load, breaking loose from the wire rope that raised it, had injured another worker by his side. It was the fifth accident of the kind that had

occurred there. The iron in the place seemed to have become brittle.

An old man with white hair opined that for some time an evil influence seemed to have been thrown over the factory, where every day there were more injured, and remarked that the doctors of the insurance companies, backed by the capitalists, were refusing to pay the full amounts of injury benefits.

Thereupon everybody began to talk at once. A young fellow, clad in the blue jumper of a mechanic, banged on the bar. Warmed with his libations he launched into a speech, denounced the capitalists at the ones to blame, declaring that it was a monstrous conspiracy to produce defective goods, so they could dismiss a number of the workers and replace them with more submissive characters. They were organizing a kind of gigantic lock-out. His neighbors pulled at his coat-tails to make him sit down, but in vain; he kept on in the best Communistic manner, declaring that the conspiracy was known and the workers would defeat it. United for their rights, the workers could oppose these clumsy maneuvers of the iron-founders with success.

With the agreeable sensation of having said something fine, he sat down and drained off a glass of wine at a single gulp.

At the Richard factory, Morain found his friend in conference with Camus, one of the directors.

"Ah, you've come at the right moment," said Barrois, "I wanted to see you. As in the other factories, we have been having curious accidents here. It is essential that we take some measures against these strikes and this sabotage before they ruin our industry."

Morain told how he had envisaged the manner in which the enfeeblement of the steels had taken place, piling proof on proof, but without in the least carrying conviction to his audience.

Camus was frankly skeptical.

"It's silly," he said. "Nothing but imagination. An epidemic of metal, no—what shall I say?—an epimetallic. If I didn't know you, I'd think you were joking. But no one ever heard of such a thing."

"I should say not," replied Morain in a voice so decided that the other was silenced for a moment.

"There's an idea in it just the same. Turn a neat profit in the market. You haven't said anything about it to anyone else, have you? Good. If I were certain . . . Anyhow, it doesn't matter whether you have the right idea or not. Afterward there is always plenty of time . . . "

The big man stopped pacing the floor, momentarily pensive.

"Yes, yes—a few whispers here and there . . . the papers . . . to create a certain atmosphere. Take our positions, upset the markets a little and then—the grand coup!" He banged his fist on the table.

Morain bit his lips, already regretting that he had spoken. He had been unable to resist the temptation to astonish his companions by a sensational revelation. He felt himself baffled in the face of Camus' view of the situation. "The old fool is right at that," he thought, his mind entering on the train of speculation on the profits that might result, but Camus would be sure to claim the lion's share. His heart filled with hatred for the other, but he managed a smile as he said:

"I don't want this hypothesis made too public."

"Why not?"

"I'm by no means certain of the facts yet, and would prefer to study the phenomenon and the methods of dealing with it first."

"Oh, that's reasonable enough. Science! Ah, you're a lucky man, Morain, to be able to give your time to abstract research. But you're right. Well, pardon me, but I must be getting along."

From the doorway he nodded to Barrois, but the latter, lost in his own reflections, failed to notice the gesture.

CHAPTER VII

The Disease Spreads

● "Oh, we have the best kind of guarantees," affirmed Morain, "or I wouldn't have considered the matter."

Engulfed in one of the big armchairs which the director of the foundry affected as giving an air of elegance to business, Barrois examined his fingernails with attention.

"Afid Bey is a swine," he declared. "He'll accept delivery of the rails and then find some pretext for refusing payment. Now there will be no lack of pretexts as you know. They won't last six months."

"But if they're made of Duro-Fer? You notice that the contract doesn't specify, and I have preferred to cut the profits a little bit and give him something safe."

The engineer repressed a smile.

Leclair, who was present at the interview, observed that they possessed an option on the Zettat phosphate deposits. "If there are any difficulties Levasseur will back us up. He's a friend of mine and has a strong pull with the Governor. There will be a few handouts to make, but that's all in the game in Morocco."

"Well, I'll think it over," said Barrois. "Just now I'm bothered with more urgent questions. The Siderosis* is progressing rapidly in my shop. The castings were attacked about eight days ago. Most of the motors have broken down. I don't know how to do anything in the midst of all the complaints we're getting.

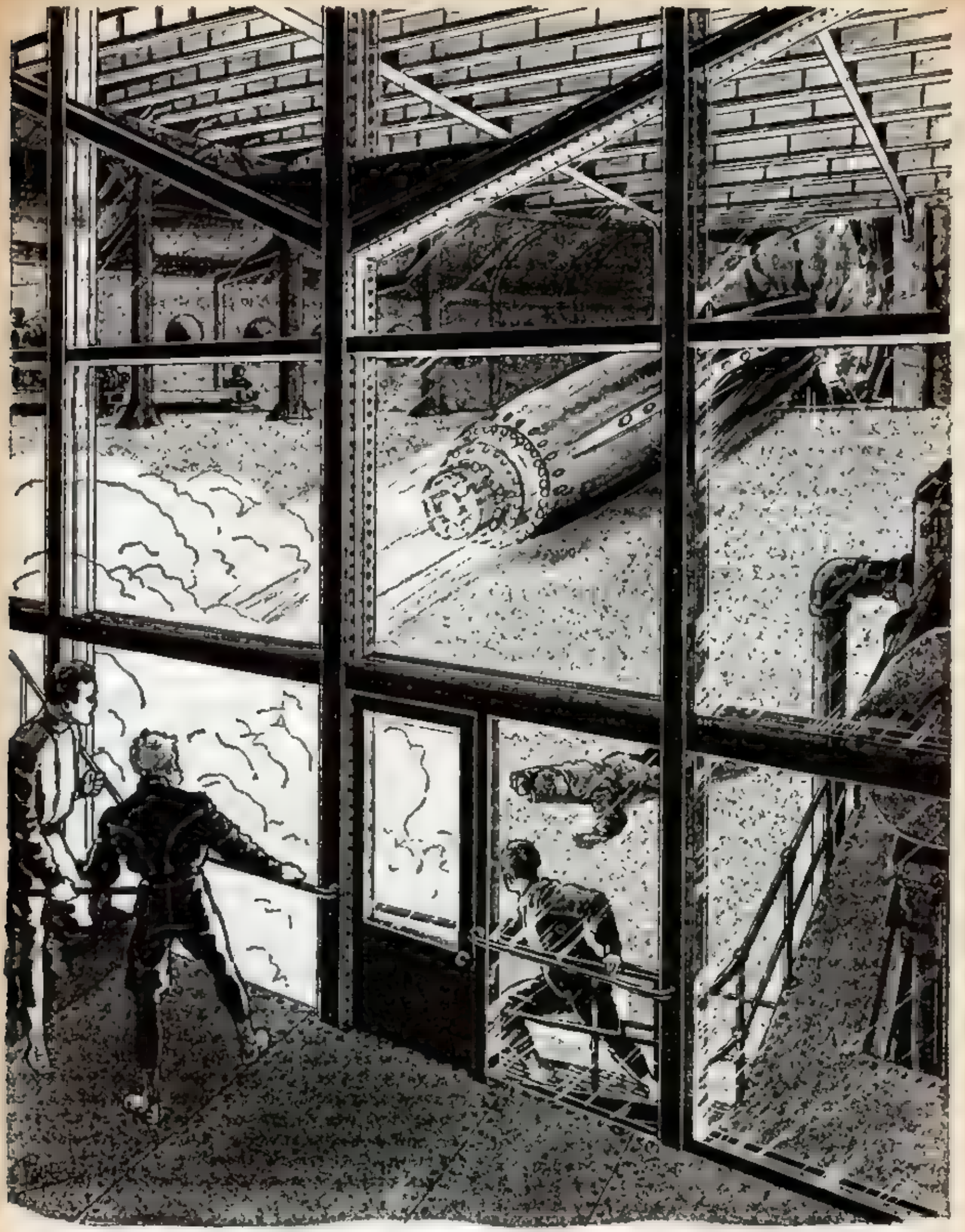
"I have mentioned this sickness of iron to my metallurgists; most of them are simply incredulous. Just the same, they are all working like the devil. But the workmen are kicking and we can get production out of them only with the greatest difficulty. They say the steel has gone rotten and that's explanation enough. One of their delegates was around making comparisons with the rottenness of the bourgeoisie the other day.

"Some of them say it's the work of foreign spies, who are doing it in the hope of discrediting our products, and to accomplish it they have put something into the steels as they are being fused. Or that spies among the workmen are trying to ruin the guns and armor we turn out so that they will be useless in case of war. All these absurdities are being repeated in the shops."

"And what do your department heads say?" asked Morain.

"Gautier and Samuel have been looking into the question for several days. Gautier lost a lot of money at baccarat recently, but otherwise he feels he hasn't a thing to worry about. 'Whether it's clumsiness or deliberate sabotage,' he said, 'none of it would have happened if our fore-

(*Continued on Page* 371)



(Illustration by Paul)

The thick door clanged and rattled with a frightful din. The resulting roar expanded to a vast thunder that tore at their eardrums.

CROSSROADS OF SPACE

By ARTHUR G. STANGLAND

● A quick, impatient knock sounded on the door.

"Enter!"

Captain Heath, in command of the new fueling "island," *88-X*, located between Neptune and Pluto at the beginning of their forty years of approximate conjunction, sat before a table poring over stellar charts. A single, shaded desk lamp, the only illumination in the room, lighted up his strong masculine features in relief against the dark background beyond the light. He glanced up from a thick volume of tables, narrowing his shrewd grey eyes to squint into the darkness.

There was an air of excitement about the bronzed man coming into the room, a something that was not lost on the calm-faced captain.

"Captain, there's something wrong!" blurted Reynolds, without even acknowledging the greeting. "For the last several hours I've been trying to raise Capostran to send your message through. The ether is dead!"

Heath took his elbows off the table, and sat up straight in his chair, a slight frown of puzzlement crossing his face.

"Perhaps there's something wrong with our equipment," he began, though he knew it was almost superfluous to mention that. Reynolds could not be accused of half [illegible]

"No sir, I've checked over everything right up to the parabolic wave projector; and there's plenty of pep in the voice channel—the needle kicks over like the back thrust of a rocket. It's not the transmitter, sir. I tell you—there's something wrong with space!" Reynolds young blue eyes were snapping with suppressed emotion, as he looked down at the commander from his lanky height. Such a strange phenomenon put one in awesome apprehension of the mysteries of space.

But the inertia of Captain Heath's practical mind would not let him jump to fantastic conclusions too soon.

"When did you last contact anybody?" he asked.

"Thirty hours ago I spoke the *Plutonian* making for her home planet, sir. That was the last call, according to my automatic recorder. Mason and I have been repairing a motor since."

Heath was silent for a moment. Older men had held his job before him, but regardless of his comparative youth he had won his place among brilliant experts of cosmonautics through sheer ability. What he lacked in years he made up for in a wealth of experience.

"If you can't communicate with anybody, then what do you suppose has happened to the pilot-beams?" posed the captain. But Reynolds was quick to sense the growing concern in the captain's strong lean face in spite of his casual tone. Heath turned to a desk phone, pressing a button.

"Hello, that you, Rawlins? . . . Say, when did you check readings on the pilot-beams last? . . . Forty hours ago! . . . That's too long an interval . . . Yes, I know it's a reliable machine, but you should take a reading every thirty hours or so instead. Take a sight now on both beams—they'll be in vertical azimuth you know . . ." he turned to Reynolds."

"Wonder if that collier has left Capostran yet?" he pondered. "We need fuel now for our own rocket tubes, as well as for the service supply. Too bad you couldn't raise Neptune . . ." He broke off, turning to the phone. "Hello, Rawlins? . . ."

A peculiar premonition coursed through Reynolds' mind as he watched an unaccustomed paleness supplant the healthy glow in the captain's face. He heard the faint voice of Rawlins, the navigator, raised to an excited pitch. Heath replaced the phone deliberately, turning to the young engineer. "We're drifting off our dynamic position—10 degrees on the Pluto beam and 15 degrees on the Neptune beam. Reynolds, you're right—there's something wrong in space! Come on, we're going topside, and check Rawlins. I want you with me." And without even grabbing for his commander's cap, the captain left the cabin in a rush, followed by Reynolds.

Together they took the steps two at a time. The fueling "island," built in the shape of a huge disc with a solid block on top, was popularly known among space-

● Mr. Stangland's story gives us an insight into the great dramas that will take place in the vastness of interstellar space after its first conquest. This story pictures puny man against a background of strange almost devilish forces. Like microbes in an infinite world we see our space-men struggling to preserve man's right of space conquest.

We must admit that what we know of the forces operating in interstellar space is insignificant. We believe, true enough, that space is an almost perfect vacuum. But is it? And if it is not what dangers, impossible for us on earth to envision, may confront the first men to dare the unknown.

We must await the first Columbus of space for the answer. But Mr. Stangland gives us one unusual view of it.

men as the "Pie Pan." A shelf flanked two sides of it, permitting the landing of ships to refuel on the direct run between Pluto and Neptune. Great airlocks swallowed them as they disappeared within. And above all protruded a small but massive quartzite cylindrical knob, giving an unobstructed view of the heavens.

Heath and Reynolds stepped out into the transparent cage that was filled with an intricate yet orderly mass of instruments, chief of which was a bright machined steelite cross much like an interferometer in the center of the room. Rawlins was peering into a small telescope on one of the arms of the cross.

"Well, what do you make of it?" asked Heath, stooping to look through the eyepiece that the navigator had relinquished. He focussed it on a tiny disc that was Neptune.

"I don't know what to think, sir, but I do know we're a million miles out of position, and still drifting—God knows where!" answered Rawlins gravely, his face a grim mask of tense lines.

Heath stood up and read the angle. Just as surely as if she had slipped some huge steel cables holding her midway between the two planets, the *88-X* was roaming farther out afield with each spurt of her giant backthrust rocket tubes. The radio pilot-beams from Pluto and Neptune automatically guiding her in space, were dead, no longer actuating the delicate tynes of the electric control slider that set off the rocket tubes to keep position.

● "For at least the last thirty hours this firing pattern has been maintained on the electric tynes, Rawlins, driving us off our point. You'll have to operate this typon by hand, and get the island back on position." Heath released the robot steersman from its locked position so that it swung free. He faced the two men, a sober expression in his grey eyes.

"I don't doubt that you two are quite aware of the fact that we are in great danger right now. If that collier doesn't arrive in several more days, we'll be out of fuel, and that means we'll start drifting around the sun in our own natural orbit. So, keep this to yourselves—no use in frightening the crew, and especially the Plutonian gang in the service shops; they're liable to lose their heads. There's hope the collier may find us by 'static conjecture,' after all, if we can get back on position."

Motioning Reynolds to follow him, Heath turned smartly on his heel, and left Rawlins, already setting up by hand a combination on the rocket firing control panel. Descending to the lower deck, the captain quizzed the engineer again.

"What do you suppose is causing this, Reynolds? Stellar radiation?"

For a moment Heath waited, watching the engineer's face. An odd look seemed to grow on it.

"Great rockets! Yes, captain, that's it, at least part of it. How idiotic of me not to think of that before!"

The two men headed for a cabin several doors down the corridor.

"What do you mean—that's part of it?" questioned Heath.

"Come in the radio room," suggested the engineer, opening his cabin door. Inside, he hastened to an ordinary phone used in radio-telephony. "Here, listen to the ether for a moment. What do you get?"

After an interval of silence, Heath looked up sharply. "Nothing but a lot of tiny little cracklings."

"That's just it—ionized gas!"

"What's stellar radiation got to do with gas in this instance?" asked Heath, perplexed.

"From the way reception sounds, captain, a very thin cloud of gas has drifted around us, perhaps an old comet—dead, or maybe a accumulation of rare gas from interstellar space. And cosmic rays, penetrating all space, have ionized this gas—that is have pulled electrons from the atoms. In other words, it's just a bunch of protons and electrons flying wild in space, colliding with one another, and making that noise you hear. It dampens all directional radio waves, just like a beacon trying to shine in a thick terrestrial fog."

"No wonder the *88-X* wandered off her position!" ejaculated Heath, handing the phone back.

A knock on the door interrupted him.

"Enter!"

It was Mason, chief engineer in the service machine shops.

"Sorry to bother you, sir," he began, "but it's Baker again. He's caused me more trouble on the job and off than all the Plutonian devils could ever think of. He's raising a howl now below about the atmosphere on board. Wish you'd handle him."

"All right, Mason. You go ahead; I'll be down." Heath turned to Reynolds, as the other went out. "Reynolds, stick to your post here, and keep on trying to raise Neptune or the collier *en route*. This gas surrounding us may drift away again."

"Yes, sir, and if I don't locate them soon, Baker will have real cause to howl about the atmosphere on board," returned the engineer significantly.

Captain Heath started down the corridor, in his mind's eye visualizing an infinite number of tiny little vortices bumping into one another. Clever young fellow, Reynolds, to figure that out as the trouble. An admirable chap. Then his face sobered, as Baker's unpleasant, dark countenance came before him. That meant trouble, using his authority to the limit—probably threatening the man, and he hated that.

He'd rather leave the machine shops under Mason's direction. Things always went along smoothly until Baker started mischief. He'd be glad when the collier arrived, so he could send the man back. A ground-hog like him had no business in space. Some things on board one must tolerate at least for a little while.

He descended to the level of the shop floor by a short ramp, and passed through an airtight door. The huge machine shops, fully a thousand feet long and five hundred feet wide, were able to accommodate four space ships at once. The massive cradles in which the ships lay while being refueled and conditioned for flight, cut off his view of the opposite side of the shops, though he could hear loud voices, and recognized the boasting, bravado bass of Baker.

Passing between the cradles, he got his first sight of the disturbance through the ribs of the skeleton supports. Baker was in the middle of a group of black-skinned Plutonians gesticulating violently. As Heath neared them, the black gang fell away to leave Baker facing the captain belligerently.

"What's on your mind, Baker?" Heath asked quietly, wondering for the hundredth time how the man could breathe through such a crooked, flat nose.

● "The air on this 'Pan' is rotten!" returned Baker in a surly voice, "When we goin' to get some fresh stuff?"

"As soon as the *Antares* arrives. Why didn't you come to me with your complaint, instead of taking the shop crew away from their maintenance duties to tell them about it?" Heath gazed steadily into the little pig eyes of the bulky man.

Baker's shifty eyes strayed away and came back. He wetted his lips.

"I was aiming to do that, sir," he answered, beginning to back down.

"But you didn't quite get it, did you?" returned Heath sarcastically. Assuming a more threatening tone, he continued. Now get this, Baker, and get it the first time: any more of your trouble making, and in the 'suspension' room you go!"

Baker started visibly. No suspended animation for him! What if he never woke up? Half-dead for the rest of eternity!

"Now get along to your quarters where you belong off duty." The captain turned to the short-statured Plutonians. "And the rest of you get back to work!"

Arthur G. Stangland

As Heath started for the ramp, his face took on a worried expression. If that collier didn't find them soon, Baker's outburst was just a small sample of what he would have to face. No use denying they were in a tight place. That put him in mind of Reynolds. He hurried to the upper deck.

"Pick up anything yet?" he inquired hopefully, entering the cabin.

Reynolds was standing in front of a tall panel, holding a phone to his ear and adjusting some tuning dials. He turned a hopeless face on the captain, and shook his head. "Not a thing yet, sir. I've called Capostran and the collier. Pluto doesn't answer either."

Heath swore softly to himself and took a turn or two up and down the room, while the engineer continued his efforts.

"No. *88X* calling Capostran on 200 . . . No. 88-X calling Capostran on 200 . . . No. *88-X* calling . . ."

The captain left the room with Reynolds' voice still droning in his ears. He decided to get some sleep and then relieve Rawlins in the pilot-beam cylinder. Another day or more and the atmosphere would be getting heavy and musty. It had been blown through the regenerators so much already that it was just about used up—unless they took the fresh store of oxygen tanks from the *B-4*, the emergency ship in the shops. That would be their last chance. What they would do after that, he left to the gods of chance.

It seemed to Heath that he had slept for a mere five minutes when a shrill buzz stabbed his subconscious through and through. In a startled daze he woke up, grabbing for the phone. Maybe Reynolds had picked up Neptune at last!"

"Hello!"

"Hello, Captain Heath?" queried the other voice, "This is Anderson. I've just checked our fuel supply in the tanks, and we've just got enough for another eighteen or twenty hours' operation. When's that collier coming, anyway? It's behind schedule now, isn't it? The atmosphere is beginning to be noticeable too."

Heath looked at a clock on the wall. He had slept for eight hours. For a moment he thought intensely, fiercely. Then—

"Anderson, close all fuel valves leading to the firing tubes!"

"But, sir, it's—"

"Do as I say. You'll receive further orders later!" And Heath hung up. His strong lean features had taken on a hard expression. There was only one thing to do now, and he was going to do it. Quickly, he dressed himself, and then went to Reynolds.

"This ionized gas seems to be getting worse, Captain," the engineer reported as soon as Heath entered. "Listen."

As he put the receiver to his ear, Heath knew immediately from the increased intensity of the crackling what the engineer meant. He turned to the younger man.

"Reynolds, you're going to take a trip. All our lives are in your hands, man. I'm sending you with a crew in the *B-4* to get beyond this cloud of gas and contact the collier, if it's out there, or else Capostran. Now stay here till I come for you!"

Reynolds' tired eyes brightened. The *B-4* going out! It lent hope to his flagging spirits, after listening for hours to the mysterious crackling and sizzling of space. Heath disappeared out the door, and hurriedly made for the pilot deck. Rawlins met him on a lower deck.

"What's the matter with the firing tubes, Captain. I haven't been able to get any response out of them," exclaimed Rawlins, as soon as he spied Heath. "We're bucking a pretty strong ether drift, you know, and if we don't keep it up, we'll start to drift in toward the sun on a long spiral."

"Rawlins," began Heath, fixing the navigator with sombre eyes, "we're breathing our last. There's just enough fuel left to charge *B-4's* tanks for a flight. I'm sending you in command of the ship. It's our final chance. I don't think there's enough fuel to maneuver this old 'Pie Pan' back into position. This ionized gas surrounding us is getting worse. The only thing we can do is get out beyond it so we can call the collier."

"But what about you, sir?" asked Rawlins. "We may not be able to find you again, if we get out into space some millions of miles. You can't last in this atmosphere for more than a few days. It's beginning to make us labor for breath now."

"You're the only one I can trust to do this job, Rawlins. We can't all go—there's not enough room on board or enough air. I've got to stay on here and watch things myself."

A something not expressible in words passed between the two men. Rawlins pressed his superior's hand hard.

"All right, sir. We'll find that collier or come back and die with you!" It was just man to man in that intimate moment.

"I knew you'd justify my trust, Rawlins. Now get your instruments together. I'll have the ship ready in an hour for you. Reynolds is going too." And with that he left the navigator.

Below decks he entered the huge shops on the main level of the "island." He found Mason at the big regenerators.

"Mason, get your gang busy on the *B-4*. Swill out the exhaust tubes, and charge the tanks. I'm sending it out."

At the engineer's questioning protest, he continued. "Yes, I know the service reservoirs are empty. This fuel is coming from our own operating tanks."

CHAPTER II

Mutiny

Mason's brow clouded at that unusual order. Was the captain going mad? For a moment Heath regarded Mason's frank open face. No harm in telling the man. He had a right to know.

"Mason," he began, "the time has come for us to face the possibility of death, and we've got to do it like real men. We've drifted out of position, and our communication has been cut off with everything. We've got to send this ship out to get help."

"I see, sir," returned Mason simply. "I can have it ready inside of an hour."

"Good."

Heath left the engineer, and started down to the rocket tube rooms. These were below the shop deck, in a maze of criss-crossing reinforced steelite girders all arranged in an intricate pattern to stabilize the "island" structure. The massive tubes, five feet thick, were butted against the ends of giant "I" beams like the spokes of an artillery wheel.

Each backward thrust of the rockets were transmitted to the whole of the rigid under structure of the "Pan." A complicated installation of thick-walled bronze piping led to the explosion chamber of each exhaust tube, carrying the powerful liquid fuel that was sprayed in measured jets. The sensitive nerves of the constantly exploding rockets ran neatly along the beams and into the ends of the chambers through tight-jacketed insulators, carrying delicate little impulses from the electrical brain that controlled the giant tubes topside in the quartzite cylinder.

But now the huge flaming maws of the man-made space mammoth were silent. The heat still rising from the firing chambers was terrific in spite of the system for drawing the heat off to other parts of the "island." At the bottom of the descending ladder Heath waited on a platform for Anderson, coming toward him on a catwalk over the tubes. Other men, terrestrials, worked around the breeches of the tubes below, stripped to their waists and sweating freely. In as few words as possible, the captain explained their grave position to the perspiring men. Anderson, a veteran rocket engineer, wiped his dripping forehead, as if nothing were amiss. To him it was just one of those things that happen in the uncertainties of space life and had to be met.

"And, Anderson, when the black gang starts to pump fuel, give them every bit of it. You'll have to switch over to the reserve batteries now for the power pumps. You're going on the trip as chief engineer. I'll send for you when things are ready."

"Aye, sir."

When Heath reached the service deck, the *B-4* was in a cradle, and a gang of the ebon Plutonians were busily engaged in the sooty job of cleaning out the stern exhausts. A thick steel brush on the end of a revolving rod disappeared into the black tubes and was cutting loose all the crystallized material on the walls. A pneumatic hose was sucking all the accumulated dust into a bin. A dirty job, but very necessary for the efficiency of the jets.

The captain sought out Mason.

"As soon as you're ready with the ship, Mason, call me in my office. I'm going up there now."

"Yes, sir."

"By the way, have you told the Plutonians the reason for this trip?"

"They're a curious lot, sir, and pestered me with all kinds of questions when the 'back-thrusts' stopped working, and then you sending this ship out. Yep, I had to tell them."

"But they're not frightened, are they?"

"They don't seem to be, sir, but you can't tell much about those expressionless black devils, you know."

"Well, do what you can to keep their morale up, Mason." And Heath started up the ramp to the upper decks. He was proud of all his terrestrial crew. Thoroughbreds of Earth they were, incarcerating themselves in this space prison, making it possible for ships to make the two billion-mile trip without using too much valuable space for fuel. But the Plutonian crew on the service deck he distrusted in a crisis like this. Especially did he dislike their undependable native psychology. He would much rather have had a full terrestrial crew, but the Plutonian government had insisted, in its trade treaty, in providing part of the complement.

Heath stopped for a moment at Reynolds' cabin, standing in the doorway.

"Anything, Reynolds?" he asked, with waning hope.

"Nothing."

He continued on to his own cabin. Rawlins stood leaning over the chart table, manipulating dividers and protractor.

"Got everything, Rawlins?"

"Just laying out my course from here." And he indicated the chart on the table. Pointing to a tiny "x" on the new paper, he continued on. "This is our present position: 600,000 miles off point. But we've also got a definite resultant drift that I've checked closely so that we can find you when we come back." He raised his eyes for a moment.

There was a silence. When they came back! Heath's face tightened a little. What would Rawlins find when he came back? A death ship, likely. The navigator hastily dropped his eyes, and went on. "If the collier is in space at all it's logical to believe she continued on by probability coordinates after the pilot-beams failed. That's why I'll make for our theoretical position. Of course, there's a differential departure integration to take into consideration, making it a wild guess as to how close they'll come to it in their—"

● A shrill buzz cut him short. Heath picked up the phone quickly. Rawlins, busy with his navigation data for the moment, continued to study in silence. Suddenly, he glanced up at Heath's sharp voice. The captain's face had drawn itself into hard fighting lines. Something wrong! He slammed the phone down, yanking out a drawer from his desk.

"Come on, Rawlins, trouble on the service deck!" he exclaimed grimly, handing the navigator a double-charge automatic rocket gun. "That was Anderson. Says he heard a racket on the deck above, and before he could reach the top platform, the bulwark door leading to the deck was slammed in his face, and locked. Then they tried the other two companionways, and they were locked too. They're going to burn their way out."

By now, the two men were descending the ramp to the shop floor. Several cradles obscured their view of the *B-4*.

"Under them," muttered Heath. But just as they were starting to stoop under the big, bulging ribs, the Captain stopped, his eyes glued to a still form face downward on the deck. Mason! And with a bloody gash in the base of his skull!

A hard, flinty gleam shone in the captain's cold, grey eyes, as they rose to meet the shocked gaze of Rawlins. It had come at last. Plutonian mutiny!

Without a word, Heath continued on under the cradle, followed closely by Rawlins. At the other side both men came face to face with Baker, in command of the Plutonian crew, carrying provisions aboard the *B-4*. Immediately, the black men came crowding up to them. Heath brandished his automatic.

"Get back!" he barked out sternly.

Heath faced Baker squarely, though glancing quickly over the semi-circle of expressionless, black faces. It was a strange thing to see one white man among that planetary race inciting them against his own kind.

"Baker, who killed Mason?" the captain began ominously.

"I did!" the other shot back savagely, "What're you goin' to do about it?"

"Arrest you for murder and mutiny!"

"Not now, Mr. Captain. It's every man for himself. The old 'Pan' is drifting out to space, and with the air supply fouled we'll all be dying like cargo rats!" Baker swung his thick hairy arms in an expressive gesture.

Though their placid faces showed no expression, the light of fear burned in the black men's eyes, the fear of a suffocating death that Baker had so vividly pictured to them. Heath cursed them silently that the renegade could play upon their simple minds so easily. They had none of the finer senses of a white man's loyalty.

"Just what are you planning to do?"

"We're setting out for Pluto, and we're not lying about it like you was—sending the ship out to get help! Get help, like a ground-hog! Just an excuse to save your own yellow skin, and leave the rest of us here." Baker's little eyes glittered.

"You fool, do you think I'd send Rawlins in my place if I had intentions of escaping? It takes an expert to navigate space. The first thing you'll do is head straight for Pluto, instead of heading out at right angles to balance the ether drift we've been bucking," exclaimed Heath deprecatingly.

"Oh, no I won't. I've been in the control room of freighters before—"

Suddenly, a huge wrench came hurtling through the air, and before Heath could dodge, it struck him heavily in the right shoulder. Then the gang surged forward and over the two men in a black wave. Heath heard Rawlins' gun go off once and that was all. Something hard struck his head, and for a while everything was a confused mass of blurry details, though he was dimly aware of being on his feet again. Finally, his clearing senses began to bring vague warnings to his whirling brain, warnings that were associated with horror. He was lying on his back again. Baker's ugly, unshaven face was leering at him from above.

"Well, Heath, you won't have to worry about air now," the uncouth spaceman gloated, "because I'm going to put you in the same condition you threatened me with!"

● The "suspension room"! That's what that sickly sweet smell was, the gas that the subject was forced to breathe while the temperature of the room was slowly dropped to absolute zero, preserving the gas-saturated blood corpuscles of the body—suspended animation. Rarely used except in extreme cases, the suspension room removed unruly members of the crew from life temporarily so that they neither used up precious oxygen nor the limited food rations. Heath found his voice.

"You traitorous devil! It was a damned mistake I didn't sentence you to 'suspension' while I was at it."

"You don't seem to appreciate what I'm doing for you, man," Baker continued ironically, "you won't have to consider oxygen or food from now on. This foul air is bad enough now as it is. And then if someone finds this 'Pan' drifting around a couple of centuries from now you'll still be alive." He was busying himself about the valves of the mixing tank preparing the gas.

Heath tried to raise his head. Then his arms and legs. He was securely bound to the table. A groan sounded behind him. Rawlins voice. Of course, they would have him in here, too. He thought furiously in his helpless position. Suspended animation! Conscious sensations would recede from him. There would be no feeling of cold or warmth. But his mind would be aware of things around him. His eyes would see with a sort of helpless abstraction. It would be a living hell! Death would be more merciful. Suddenly, a hissing broke into his confusion of thoughts, a swift hissing that carried with it an insidious sweetness. It was getting colder too. The preserving process was beginning!

"Sweet dreams, Captain!" suggested Baker, backing out of the gasketed door.

Heath felt a horrible nausea at the pit of his stomach after a few thin wisps of the saccharized gas were drawn into his lungs. He struggled with his bonds, pulling and straining with a desperate fury. Damnation! His brain was blazing with the gas-saturated blood surging through it.

"Rawlins!" he shouted, twisting and squirming.

A feeble mumbling answered his call. Poor devil. Either knocked cold by the Plutonians or else going under the gas pretty quickly. Suddenly, Heath ceased his futile struggling. No use. It was only making him breathe deeper of the gas that was pouring into the chamber now. He lessened his rate of inhalation, and relaxed his tingling

legs. That much he could do to save himself from going under. But the cold! He shuddered involuntarily from it in spite of himself. If he breathed deeply of the gas, that sensation of cold would leave him. But it would also send him off into a timeless detached realm . . .

As he listened to the irritating hiss of the gas, sudden realisation provoked him to a mad, unrestrained battle with his metal shackles in spite of his blazing brain that seemed to be filled with molten metal. Another strange, new hissing and buzzing was paralleling it, a sharper sound that came from beyond the door and under the deck. Anderson and his rocket tube crew!

Suddenly someone was yelling and shouting in an insane frenzy. The voice seemed to echo loudly in the room, and to Heath's half-numbed brain it was a strangely familiar one. Thin mists drifted away from his eyes, or was it gas? Somehow everything clarified, and he discovered in his returned consciousness that he was yelling and shouting madly at the top of his voice to the men below, burning their way through the heavy steel bulwark door leading into the corridor outside!

A solid, ringing clang burst out of the hallway, as something crashed to the floor. The buzzing stopped. Came the heavy clumping of many feet. A door swung wide. Figures were crowding into the room, milling about the valves. Hissing and rumbling of voices came to his ears in a hodge-podge of noise. Someone was lifting him off the table.

"Captain!" Somehow the voice was familiar. "How long you been in here? Can you stand up?" Then in a stupid way he knew—Anderson!

The man turned to the others. "Come on, men, get them out of here into the air—and lock that door. Got to keep this stuff in here!"

In the corridor Heath and Rawlins revived rapidly, breathing deeply of the fouling oxygen, and exhaling to rid their systems of the saccharized gas. As soon as he could stand, Heath started for the ascending stairs, quite unsteady on his feet.

"Help me, Anderson, we've got to get up on the service dock, and stop Baker. It's mutiny!"

The engineer caught his arm, and together, one helping the other, they raced up the steps followed by the rest of the rocket crew. At the top of the flight a great hissing of air reached them. Heath cried out in alarm.

"The ship's in the lock now. Hurry—cut out the radio controls on the pneumatic pumps, and lock the outer door of the lock. We've got 'em trapped!"

The *B-4* was nowhere in sight, and neither was the cradle she lay in. The lock cylinder nearest them was blowing air in a great noisy blast. An electric pump whirred at the side of it. Heath, his lean face quite pale, barked out his orders quickly, watching the big face dials stop their rapid dive. One of the men had cut off the motor. A quick yank and several platinum coils with delicate attached wiring were torn from powerful solenoids, operating the big switches that controlled the outside door of the lock. The *B-4* was trapped inside now, her crew unable to open the outer door of the lock by radio control.

Heath stood off from Anderson. "I'm all right now; I can walk alone."

He turned to a crew man. "Johnson, break out enough steelite stock handles for the men—they'll do for clubs. We're going in there and get that gang!" The man hurried for the tool room.

"All right, ease the lock—prepare to open."

CHAPTER III

The Menace of Space

● Suddenly a series of close-timed explosions sounded inside the big cylinder. The thick door vibrated sharply with the impacts.

"Look out—they're going to ram the outer door with the ship anyway!" Anderson grabbed Heath by an arm, and started for an ascending ramp as fast as he could go.

Suddenly the heavy, thick door clanged and rattled with a frightful din, as if fending the shock of a meteor swarm. The resulting roar expanded to a vast thunder in the big shop room. Heath felt the deck tremble. And then just as they were nearing the bulwark door, a sharp, stinging clap tore at their eardrums. It echoed back and forth in the big space of the shops and then died away to be followed by an awesome silence. Baker and his strange henchmen had blasted their way out!

Heath and Anderson hastened to the nearest port at the end of a corridor. Out there in space leaving a fiery tail behind her, fled the *B-4*, already growing smaller and smaller. Bits of the shattered outer door floated by the port. Both were silent, watching their lives die out slowly with the dimming of the ship's flaming exhausts. Reynolds came rushing down the corridor from a flight of stairs.

"What was that explosion I heard, Captain?"

Heath turned grave eyes on his radio engineer.

"Reynolds, I guess our names are going to be added to that growing list of mysterious space tragedies. Baker seized the *B-4* with the Plutonians, and is now heading for Pluto. Guess we've just about finished our space-time journey."

Reynolds burst out in profane unbelief, and then stared out the port where a tiny flame burned in the ebon skies. "Guess you're right. Sort of leaves us on the rim of things, doesn't it?" he said mirthlessly.

There was a silence. Heath looked over his men, mostly from the rocket rooms. They hadn't taken time to put on their jackets, and were still naked to the waist. Soot and sweat streaked their bodies and grimy faces. Some were quite young—their first time out, and he felt sorry for them. Too bad they had to die. But not a man whimpered. Every eye was on him. If there was a way out of the situation he'd find it. Only the trouble was, there didn't seem to be any way out!

"About the only thing we can do is keep a vigil at the radiophone, and hope that this damned gas drifts away," he offered.

Suddenly, a loud pop echoed in the shops and in the corridor.

"What's that—a meteor?" asked someone in a startled voice.

Everyone listened in an intense, nervous silence. Another sharp report followed.

"No . . . listen!" exclaimed Heath. A faint hissing reached their ears from the shops. "It's the air-lock. Must be leaking!"

A rising wind seemed to spring up about them, rushing

for the shops. It was like the brewing of a tornado, appearing suddenly from out of nowhere to whip at their clothes with savage, clutching fingers. The hissing quickly rose to a hollow roaring.

Madly the crew made a rush for the shops, stumbling over one another. And the air rushed with them, swirling into the shops and out of the lock, air that was precious, even though stale and dry. Another sharp report. It echoed above the howl of the growing wind storm. At the top of the ramp Heath fought to keep his footing on the deck. Wind! It was a gale! A gale that sought to lift the men from their feet, as they struggled against it. The air came rushing down the corridors from three decks to swirl crazily around in the cubby vestibule and then stream through the door into the shops like water through a venturi-meter.

"Got to close that shop door!" yelled the captain in Anderson's ear, while holding on to an overhead strut.

The engineer nodded his head. "Yeah, if we can keep it from slamming!" he bellowed back.

"We've got to, else we'll have to go up on the third deck and close the bulwark panel. That won't leave us much air then!"

Another pop came from the collapsing air-lock. The strain on it had been too much. Tremendous streams of flame from the exhausts of the *B-4*, forcing it inward, had weakened the radiant lock-bolts in their guides, and with the air pressure from within forcing it outward again, they had snapped one after the other with sharp reports.

As Heath made his precarious way to the door, fighting the wind to keep his feet, he got a full view of the air-lock out in the shops. Real fear seized him then. The big steelite lock was bending outward more each time a bolt was sheared off. It was slewed out of position in the gasket casement so that a large black hole appeared where the massive hinges had broken off. And through here the atmosphere of the entire "island" was racing. If the lock collapsed completely, it would snuff them out quickly. Even now death was stalking him. Heath and Anderson reached the bottom of the ramp safely. Several more men joined them. There was no more room for the rest in the small space.

"Now, I want you to hold on to me. Got to keep it from slamming!" yelled Heath, cupping his hands in a megaphone.

● He released the tie-back chain holding the door to the wall, and took a firm hold on the lever rail, lifting it up so that when it was closed he could shove the locking-bolts home. Anderson took a tight grip around his waist and the men behind did the same to the man in front, the last one holding fast to a stanchion. Slowly, carefully Heath started to let the door close. The men above, watching, saw his hands grip hard and then turn white when the air blast caught it. The men holding him gave a little. Could they hold it? Heath grunted with the effort.

God, it was pulling his arms from his shoulder sockets and cracking his elbow joints! But he'd hold fast! Anderson's wiry arms seemed to be biting into his waist like a cable loop. Suddenly, the smoothly pivoted lever in his hand slipped and swung down, shoving the lock-bolts out. Losing his grip in the momentary release of tension, Heath could feel the door being yanked inexorably out of his hands. It was going to slam! There! His frantically gripping hands slid off the bar. Immediately, the tornado of wind crushed the heavy steelite door into the gasketed jamb, wrenching the whole panel out of line. The protruding ends of the lock-bolts had been buckled against the casements, tearing out the thick padded gasket.

For a moment it arrested the gale of wind. But the inertia of the disturbed atmosphere was too great. All the men could do in that split second of time was gaze at it in horrified fascination. There was a loud report. A lock-bolt chipped off. And then the door caved in like a collapsing vacuum can. Immediately, the atmosphere surged through the door with increased velocity. Heath clung to an iron railing.

"Top deck!" he bellowed as loud as he could, starting up the ramp, "Top deck!"

The men followed him, pulling themselves up by the railing in the teeth of the gale. Heath fought hard to keep his reeling senses. The dropping air pressure affected the equilibrium canals in his ears, especially here in the middle of this vortex where the pressure was even less than on the top deck. A shooting band of pain clamped around his chest with sudden intensity. Heath gasped for air, the rarity of it making him swallow continually. It hardly filled his lungs.

He felt as though he were under the glass bell of a giant vacuum pump. Somehow or other he blundered his way to the top of the ramp. The men behind had their mouths wide in a gasping effort to get air. At the second deck the wind was not so great, and yet all were conscious of the dropping pressure.

"Hope we can get the bulwark closed before that air-lock gives out!" Heath yelled in Anderson's ear, even though the wind was not howling here. Pressure behind his eardrums made them sing like a man's ears coming out of a pressure tank.

"Well, if we don't, we'll not have long to worry about it!" Anderson returned laconically.

Heath reached the top deck, and made for the controls to slide the bulwark in place. Everyone was laboring for oxygen. He looked over the men. Anderson, Reynolds, Johnson . . . Rawlins? Where was he? The only one missing!

"Where's Rawlins? Anyone see him?" he asked anxiously.

No one seemed to know where he had disappeared. It had been every man for himself in the terrific effort to climb the stairs in the rarified atmosphere. Apprehensively, Heath turned to Anderson.

"Anderson, I'm putting you in charge here," he said quickly, looking over the rest of the men, "if that air-lock gives out before I get back close this panel tight."

"But—but what about you, sir?"

"If that happens, I'll be 'way beyond worrying what's to become of me!" returned Heath with a wry smile.

"Let me go instead, sir!" the engineer cried, starting for the companionway.

"Anderson!" It was a curt command. "You stay here!"

"Aye, sir." And he came back reluctantly.

"Close the partition now when I leave, and hold it ready for us when we return." Heath started down the flight of steps. He stopped for a second. "Reynolds, get into your

cubby-hole and plant your ear on the phone. Don't dare leave it!" Then he disappeared down the steps.

Heath was laboring painfully for breath by the time he reached the second deck. Strange how far away his footsteps sounded on the metal stairs. If only he could get his lungs full of air once! Even if it were fouled. He felt as though he had been thrown flat on his stomach. An ominous sound of howling wind reached him from the lower decks. Poor Rawlins. If the lock collapsed . . .

Suddenly he spied him. At the foot of the stairs the navigator sprawled out against the wall where he had evidently paused for breath, and then fainted, sliding down the wall to the floor. Blood trickled from his nose and over his lips to the deck. The thin air and the struggle up the companionway had been too much for him.

Heath wasted no time in reviving him. It was going to be a terrific effort as it was to get the limp body up to the top deck in time. Too bad he didn't bring along some of the crew after all. But then, he hadn't wanted to sacrifice any of them. The possibility was too great.

● Quickly, he stooped down and picked up Rawlins, putting him over one shoulder. Then the gruelling toil to lift one foot after the other, ever ascending the steps. Up, up he fought his way—fighting for breath and fighting an almost overpowering nausea. His fierce determination to get to the top of the steps and up the next flight to the top deck became a dull litany in his brain, a set of stimuli that drove his aching muscles on after all had become numb. Odd blood-colored globules were beginning to appear before his eyes. In a strange, detached way Heath carried on, wondering vaguely at the red spheres in space before him. Now they were beginning to burst into flaming streamers like an Orion nebula.

A moment of stark reality returned to him. Maybe this was red death! Or perhaps it was Nature's way to protect an organism driven far beyond its normal capacity for punishment. Then the top deck appeared. He was stumbling up the steps in a final spurt of energy. Something vital within him was fast being dissipated. Things began to sway drunkenly around him. The steps he had been mounting automatically seemed to grow higher with each effort. Instinctively he knew that when he reached the last step, that vital something would be gone, and he would collapse there. Suddenly, things began to happen fast. From below came a sharp clap of metal striking metal. Wind tore at them, sucked at them with the mighty power of a vacuum.

"Grab his arms!"

In a blurry sort of way he was conscious of men dragging him over the last step and through a narrow opening, a furious vortex of wind. Rawlins heavy weight was gone from his shoulder. He kept swallowing. Air! He could almost taste it. Something clanked into place.

"My God, captain, you were just in time!" Anderson was saying in a trembling voice, "the air-lock collapsed just as we caught sight of you coming up the steps."

After several wheezing gasps Heath was able to speak.

"Rawlins—how's he?"

"He's over there drinking water. Just fainted from overexertion. He'll be all right. Guess his heart couldn't stand the strain in the thin air."

"Poor Rawlins." Heath swallowed the brackish water Anderson handed him and liked it. It slaked his dry throat. Then he looked around. "Well, here we are—on the top deck," he hesitated, laboring for his breath, "and about twelve hours of atmosphere left."

"We're damn lucky to be this far and alive!" exclaimed Anderson appreciatively.

"Reynolds at his post?" asked Heath.

"Aye, sir, in his cabin."

Helped by Anderson, Heath slowly made his way to the radio room. Reynolds was at a control panel, slowly twisting a tuning dial and listening to his phone.

"Pick up anything besides that blasted space racket?" inquired Heath upon entering.

Reynolds looked up, startled. He reached for a tumbler switch. "Not a thing," he answered glumly. Then he started to speak into his transmitter. "Fueling station *No. 88-X* calling for help on 350! . . . Fueling station *No. 88-X* calling for help on 350! . . ."

Anderson and Heath sat in silence, listening intensely with Reynolds between calls for some answering voice. All that issued from the speaker was a mysterious burning and crackling that expanded and faded ceaselessly, a seeming melancholy essence of space that infused them with an awesomeness of the vast stretches of uncharted heavens.

Heath, in spite of himself, was becoming discouraged. It seemed so hopeless now. No one would ever find them, being here on the outskirts of the regular inner trade routes. He looked around hopelessly. Humph . . . breathing their last. Suffocation! A horrible end for all these men—rolling on the deck with lolling, swollen tongues and gasping hoarsely in the final stages of strangulation. Even now they were wheezing for their wind. Maybe he owed it to them to suggest a more merciful way out: suicide. Suicide before they had to go through that other horror.

Suddenly, Heath came out of his apathy. A mumbling of voices broke in on his sombre mood. Anderson and Reynolds were at the port hole, talking excitedly.

"What do you suppose it is?"

"Looks like a small sun, doesn't it?"

Heath hastened to the port. "What's wrong?"

"That big ball of fire," exclaimed Reynolds, pointing into the heavens, "blazed up from nowhere just now!"

In the hard blackness of space burned a strange orange ball, a sphere that was constantly expanding, assuming giant proportions.

Heath made a mental calculation, a rough estimate of its distance. Probably twenty thousand miles off, perhaps less. But the longer he watched, the more he became convinced it was approaching them, and at an appalling velocity. The rest of the crew had come in, and were gaping in astonishment at the phenomenon.

"It's coming our way!" announced the captain uneasily.

● Fearfully the men watched the menacing intruder. An ironical smile crossed Heath's face. Suicide! They didn't have to wonder about their fate now. It would be instantaneous, when that huge sun struck them. Closer and closer it grew, filling all the vast space of the ebon heavens with its lurid mass.

Suddenly, a great flaming arc shot out from the ball of fire. The rest of the vast bulk seemed to flow after it to engulf the *88-X*. Horrified, the men fought away from the port with animal cries of terror. Heath drew away in a white fright, still watching the port in hypnotic

fascination. It was upon them! An advancing holocaust. A sweeping world of incandescence. There was no solid impact. Just a hot leaping flame outside. A sheet of curling, darting fingers.

And then Heath blinked momentarily, and stared in bewildered amazement. All was black again outside, a dead blackness upon which burned the usual steady light of legions of stars. A startled, dumb-founded silence settled upon the crew. They looked around at each other half sheepishly. Still alive!

At the port Heath gazed out, astounded: in the rays of light from the cabin drifted a haze of snow white crystals passing in little clouds at times! He turned to Reynolds.

"What do you make of that!" he ejaculated, "a vast flame in space that disappears into nothing followed by a cloud of crystals."

But before Reynolds could answer, another voice broke in—a sonorous voice coming from the loudspeaker.

"*Antares* calling fueling station *88-X* on 300 . . . *Antares* calling *88-X* on 300 . . ."

"It's the collier—!" Excitedly Reynolds jumped for the instrument panel, yanking open a switch to cut in. With hands that almost trembled he lifted the transmitter to his mouth: "*88-X* answering on 300! . . . *88-X* answering on 300!"

The droning voice in the speaker stopped for a moment, as if completely amazed. Then it came back in a torrent: "Hello *88-?* Are you all right? Where are you? Where are you? We've been cruising in Cube 54-jB for twenty hours looking for you . . .

Quickly, Reynolds gave a full account of everything—Plutonian mutiny, the collapse of the air-lock, and the great flame in space.

"We've got a direction needle on you now. Haskins is computing your distance . . . here it is—30,000 miles. We're making all possible speed to raise you in several hours. It's a good thing you answered when you did, man, we were just about ready to turn back. We found your *B-4* scattered all over space here, and thought you had abandoned the *88-X* only to pile up," said the *Antares* operator. "Your man Baker wasn't much of a hand at navigating around a big meteor that got in his way—made a perfect hit!"

Heath grabbed the transmitter from Reynolds' hands.

"The *B-4* piled up!" he cried aghast.

"Yeah, forgot to tell you we were attracted to it by the big flame you saw. In fact, Baker caused it. He must have been carrying a tremendous store of oxygen. That's what caused those clouds of hoar frost crystals you saw."

"What do you mean?"

"Don't you know you've been drifting in a cloud of ionized gas?"

"Of course. It put our pilot-beams out."

"Well, hoar frost in space is the result of combining *oxygen and hydrogen!*"

THE END

Still Another Prize Contest--On This Month's Cover

The enthusiasm created among our readers by the novel contest in the July issue, based upon the cover picture, has warranted our starting another contest, based this time on the present cover.

As usual, Paul has drawn the cover picture; and again he has suggested an unusual and suggestive scientific idea, that it will be your privilege and pleasure to puzzle out.

We will give this hint—you will find it helpful to look at the cover picture from varying distances and under varying conditions. It may be advisable to turn it sideways, upside down; to magnify or contract it; to look at it in sunlight, in the glare of an electric bulb, etc. etc.

This game is taking on. It will exercise your imagination, your scientific knowledge, your ingenuity.

PRIZES

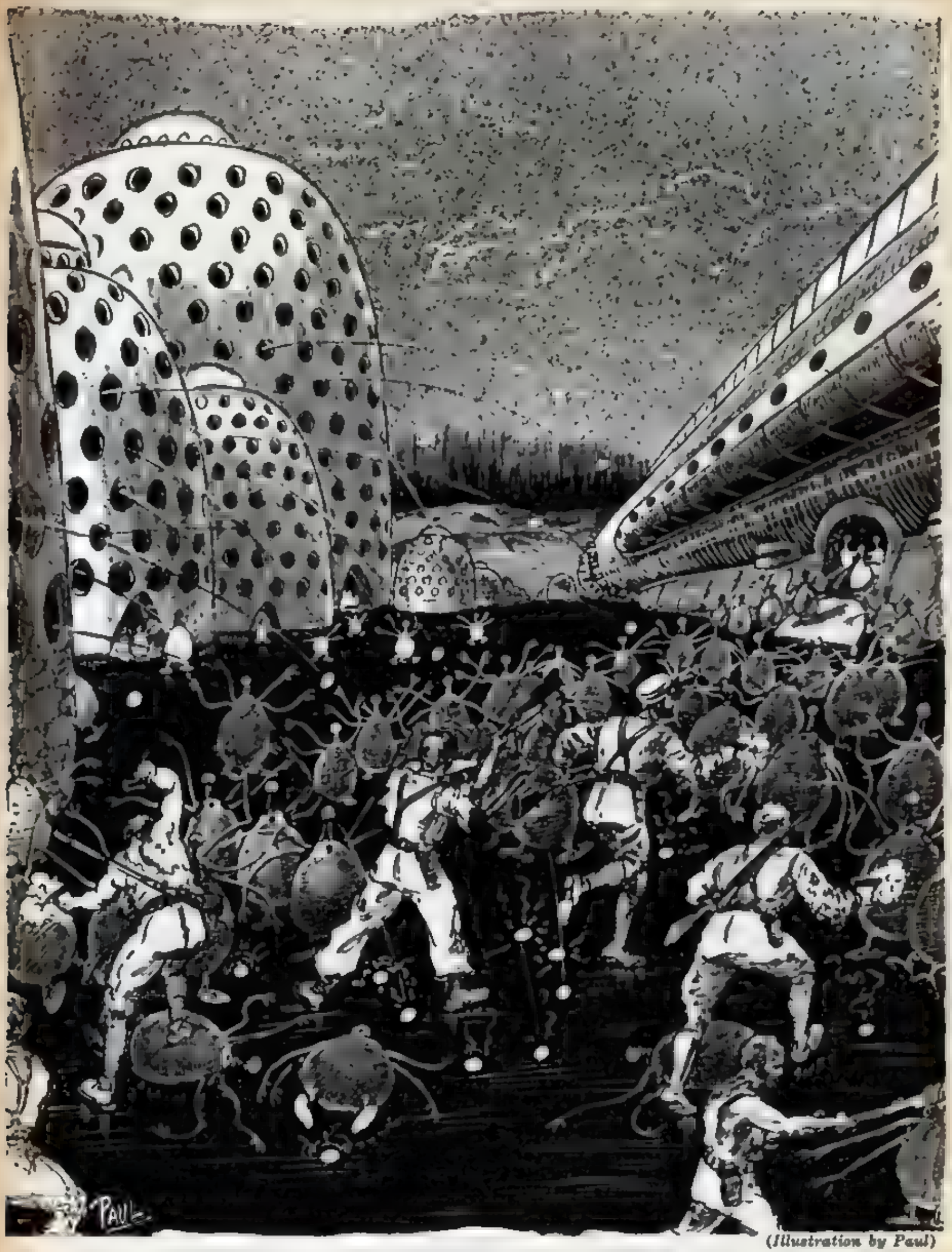
First Prize ——— $15.00
Second Prize ——— 7.50
Third Prize ——— 5.00
Fourth to Tenth Prizes

—A year's subscription to either WONDER STORIES or EVERYDAY SCIENCE AND MECHANICS, at the option of the winner.

The rules of the contest follow:

1. You are asked to state, in a letter of not more [illegible] 300 words, your explanation of what the cover on this issue represents.
2. The [illegible] of the cover is scientific and the letter therefore should [illegible] the scientific explanation.
3. The letter may include sketches to make your meaning clear. Such sketches should be on a separate piece of paper, and clearly drawn. All letters should be typewritten double *spaced* or penned. Pencilled letters will not be considered.
4. Letters will be judged by their ingenuity, convincingness and scientific content by the editors of WONDER STORIES, whose judgment will be final.
5. The editors cannot engage in correspondence in this particular contest, and no manuscripts can be returned. From this contest are excluded the employees and their families of WONDER STORIES, as well as the allied magazines published by this company.
6. This contest closes on Sept. 25th, by which time all entries must have been received. Prize winning answers will be printed in the December 1933 issue of WONDER STORIES.

Address all letters to Editor Cover Contest, c/o WONDER STORIES, 96-98 Park Place, New York City.



(Illustration by Paul)

"Club your rifles," he yelled. Mechanically we unslung our rifles But the green balls were surely overpowering us. Our arms were heavy

IN MARTIAN DEPTHS

By HENRIK DAHL JUVE

● Now that our troubles with the inhabitants of Mars have finally been settled and the events have at last taken a quiet, sketchy place in history; where the characters have become demi-gods of faultless marble, it might be safe to tell what really happened.

History lauds the man who first sent a rocket to the moon and mentions the excitement with which astronomers saw the flash of mixed magnesium and oxygen when the rocket struck. It devotes some space to "Slim" Dawson who made the first successful round trip to the moon. After that events occurred so fast that very little space was left for the man who made the first practical application of space travel.

It was strange and farsighted reasoning that prompted Dr. Matheson to undertake his fateful trip. The ship was almost completed when I came on the scene. I had fitted myself and worked for a number of years as a radio consulting engineer, so was detailed to design and install a compact radio set aboard the craft and to operate it during the flight. It was during the intimate consultations over designs and plans that I often talked with Matheson concerning the philosophy of what faced us.

"Nordstrom," he once said, "the world is disarmed now. We of the United States are faced with three eventualities. The course of evolution is a strange thing. Civilization travels toward the west. It seems inevitable. I often wonder why. Is there some psychic phenomenom akin to the tides as they are dragged along by the sun and moon or is it some tendency deeply rooted in the race subconscious? I don't know, but the fact remains that those in the west conquer those immediately to the east. Those in the west continue to advance while those left behind merely settle down and live.

"We have watched the crest-wave of civilization and pioneering travel along the Mediterranean from the Orient, through Greece, Italy, up through Spain, France. Portugal and England and the other European countries and then across the Atlantic. We have seen it slowly cross the United States from east to west and hesitate on the Pacific coast. Even as early as 1932 history began to center about the Pacific. What next? Will the crest of the wave leap across the Pacific to the Orient? Or will it pass into some new realm which we call the fourth dimension? Or will it pass into space and conquer the other planets?"

"But the nations are disarmed," I reminded him, little realizing the significance of his words. "Conquest is a thing of the past."

● According to Mr. Juve, civilization never stands still. It either advances to new conquests, or decays and perishes. The law of life is still one of eternal struggle.

From the conquest of the earth, man must by some law of nature, extend his activities to the other planets; and from them to interstellar space, to go—no one knows where.

To some people this view of life may be rather disheartening. They probably wish that at some time, the human race could settle back and live eternally in quiet, peace, and in calm enjoyment of our material and cultural possessions. But such people, Mr. Juve believes, will be left behind in the onward march of civilization.

You may not agree with Mr. Juve; you may not agree with the tactics of earthmen in that "onward march," but you will agree that here he has given us a "rattling good story."

Dr. Matheson, who by the way, was a mathematics professor in a little western college, looked at me with his intense blue eyes. They twinkled.

"You forget that all progress comes from struggle, or perhaps I should say, with struggle. When we were barbarians the force of arms was sufficient. But gradually this was supplanted by the force of economic struggle and we substituted money for guns. As we become less barbaric money will give way to something else. But there will always be struggle. The big question facing us now is, shall the white race sit back and let the supremacy go to the Orient, or shall we continue to move ahead and retain our advantage? We can be certain of only one thing; civilization will continue to move toward the west. If we don't move it will leave us behind. That is why we are visiting Mars. We are, as it were, going *beyond the earth* in an attempt to lead the crest of the wave of pioneering to interplanetary space and to other planets."

That, in short, was Dr. Matheson's reason for the trip. It seemed far-fetched at the time. To me he was just another professor; a perky, wiry little one at that. But subsequent events have shown me that he was right, and that the question he raised was worthy of the most serious consideration.

● Of the actual flight I need say but little. Present day interplanetary travel is matter-of-fact for business or pleasure and almost everyone has experienced it. It has become part of race habit. But when we roared away

from the earth on that hot night in July, 1982 we were trusting our lives to a thousand and one unknowns.

I'll never forget the terror of that moment when Matheson gave the signal. We had been so busy on construction that we had given little thought to our actual flight. Now, that the airlocks were closed and we were penned up in that hundred-foot cylinder of gleaming metal I felt such fear as I never experienced before or since. I stood beside the porthole in the radio room where the mixture of gasoline and liquid oxygen was pumped into the rocket tubes.

Suddenly the little ship was enveloped in a savage furnace of flame. Even through the double hull the roar was deafening. The craft shook violently under the terrific blasts of the stern rockets. All of my faculties were swept away in that awful holocaust. I stood rooted to the deck, the sickening fear of the unknown welling up within me and paralyzing my mind.

I saw the earth fall away and our tail blasts straighten out into long streamers but I did not see the marvelous beauty of it nor feel the thrill of accomplishment. Fear clutched at my throat and I breathed in tremulous gasps. I tried to turn from the porthole but I was unable to move. I felt as if a great weight filled my torso. I was afraid to move!

Gradually we became accustomed to our flight and moved about at our duties, although we walked slowly and carefully as if on eggs. Our nerves were on edge. When the roar from the stern blasts changed its tempo slightly we crouched, new terror welling up within us. The first time Matheson touched a button and one of the little steering rockets burst into a high-pitched scream one of the men screeched and fell into a dead faint. After that Matheson always warned us when there was to be a change in the course or speed.

Word went around that Matheson was not sure of the rocket motors. It was whispered that they might burst at any moment and tear the whole stern from the ship. Other rumors of possible tragedy kept us in a constant state of terror. The whole trip was one long nightmare with horror staring at us with bottomless, soulless orbs. We lived in our imaginations.

The worst came when we arrived at the point where the rocket motors were shut off. We had been terrified by the vibration and noise and flame, but now we feared the silence. We flashed through space at incredible speed. All about us was silence; a curtain of black velvet, sparkling with points of silver. Now as I look back I realize that it was *change* that terrified us. So long as a condition remained and became monotonous we became accustomed to it, but the moment there was a change new terror gripped us.

It was when the propeller tubes were silenced that the cook went stark mad. We were still gripped by the unutterable silence and were struggling to accustom ourselves to it when a terrible scream echoed and reechoed through the ship. It began as an eerie wail that rose to a shrill scream and then broke down into demoniac laughter. We stood rooted in horror. It was worse since it expressed exactly what the rest of us felt like doing at times.

We rushed into the engine room where the cook was brandishing a meat cleaver, scattering the crew before him. His eyes were wild and staring and drool slavered from his drawn lips. He screamed that he was going to destroy the machinery—anything to make a noise. He said that the silence was the work of the Devil and that he was out to wreck it.

We tried desperately to disarm him but it was impossible to get near him. Gradually he drove us back, clearing a lane toward the delicately adjusted machinery at the stern of the ship. We despaired, a new fear tearing at us. I felt an insane impulse to rush in despite the flashing cleaver although I knew that would be madness, for the lack of gravity made footwork impossible. The best we could do was to drag ourselves about by means of the hand rails.

For a minute we were madmen at bay; all except Matheson. Perhaps it was his indomitable will or perhaps the sense of responsibility that kept him cool and collected during the entire trip. Now he very quietly came up behind the madman with a chair he had slipped from its deck anchor. He brought this down on the head of the cook. The madman's eyes rolled upward. He relaxed completely and his cleaver floated slowly toward the end of the room where one of the engineers caught it. The cook was driven down upon the deck from which he bounced slightly and floated toward the ceiling, his arms and legs grotesquely outflung. We quickly dragged him down and trussed him with wire to one of the deck anchors.

When we finally brought him to, we found that our cook had become an automaton. It was probably the shock of the blow that quieted him. We found that we could trust him, although we had to tell him exactly what to do, what and how much to cook and when. When he was not carrying out orders he slumped in the corner of the galley, staring with unseeing eyes and muttering to himself.

● We were nearing Mars now. It had grown to a huge disc in the sky; a disc that held for us a strange promise and foreboding of tragedy. We went about silently, wishing that we might not have to land. We wished that we could now sail aimlessly through space forever. All except Matheson. He seemed elated and I believe he really was. Even the second in command, young Dr. Drummond, was pale and hollow-eyed.

I'll have to tell you more about this Dr. Drummond. If there is a fate in operation, surely it was fate that placed him second in command of the expedition. He was a round faced, blue-eyed man of medium build, wilful and moody. Sometimes he was jolly and witty and the next moment taciturn and abstract. He could never decide what he wanted to be.

Perhaps that was because of his wide interests and long string of letters after his name. Along scientific lines he was a genius. But more, he was a poet and philosopher. Sometimes he thought that he would like to become a mathematician and astronomer, sometimes he longed to be a poet, at other times an explorer or a financier. Usually, however, his philosophy rode on a laconic track and he considered the ideal existence would be that of plain bum. What irony of fate brought him among us I never learned. However it happened, it was his hand that was to tip the scales and unbalance the destiny, not of empires, but of planets.

The planet Mars grew until it was a vast wall in our

path. Matheson and Drummond worked constantly, taking observations and computing positions and distances. When we were near the tiny chart-house we spoke in hushed whispers, knowing that our lives depended upon their figures and the readings on the slide rules.

Suddenly the steering rockets on one side burst into flame and noise and the ship rotated until the stern was toward the planet. Then the propeller tubes roared into action and we again had to accustom ourselves to the vibration and din. The ship was completely enveloped in flame as the jets from the rockets flared out and expanded in airless space.

Our nerves were like knives set on edge. We were backing toward the planet, flying blind, for we had no instruments such as used on modern ships. For hours the roaring blasts slackened our speed and worked against the pull of Mars. At last the ship came to a rest and then began to draw away from the planet as the recoil of the rockets forced her upward. We crowded about the portholes for a glimpse of the land, having been warned that the jets were to be extinguished for a moment to get bearings. Suddenly we were enveloped in a profound and awesome silence.

For only a moment we hung motionless, less than a mile above the surface of Mars. We had a glimpse of the sun sparkling on the canals. To the south and west and east the reddish green forest of giant trees stretched away beyond the horizon. To the north the forest thinned to sparse vegetation that stopped abruptly against the edge of a vast field of red plants. Before we could see more we were again enveloped by lurid flame and thunderous roar.

Drummond came out of the chart-house, his face white as chalk. He stood for ten minutes, clinging weakly to the railing and then went back. It was later that we learned that they had calculated to stop the ship for bearings at least a hundred miles from the planet. But the rush of gases through the rocket tubes had worn them and impaired their efficiency. When Drummond saw that they had stopped just in time to avoid a crash it unnerved him completely.

The tubes had been roaring under reduced pressure. Suddenly the white flame that surrounded us was tinged with lurid red streaks and black smoke. The tubes increased their roar slightly and then we settled down on end and canted sharply. The tubes were silenced. We tried to see through the portholes but they were blackened with smoke. The external thermometer told us that we had started a forest fire. It was five hours before the temperature came down to normal and a test of the air was made. It was breathable.

CHAPTER II

Mars

When we opened the air lock and stepped upon the land of Mars we stared about us in wonder. We had decided to land near that intersection of canals which our astronomers have named the *Lacus Solis*, or the Lake of the Sun, thinking that this intersection of waterways form the most natural location for dense population if indeed we should find the planet inhabited.

Now we saw our mistake. The wild vegetation grew along the canal banks, extending for about thirty miles on each side and then dwindling to nothing in the arid wasteland. At this intersection there was no break in the vegetation between canals and we found ourselves in a vast forest of mammoth trees.

Henrik Dahl Juve

The flame of our rockets had seared a great hole through interlaced foliage of the trees. The noon-day sun glared down upon us through this hole. Fallen trees smouldered here and there over the two or three acres of fire-swept underbrush. The nose of our ship rested in the crotch of a monster tree, tilted at a thirty degree angle.

We examined the trees, some of which were a hundred feet in diameter and perhaps several hundred feet high. We were particularly interested in the bark, which was smooth as glass and of the translucence and color of amber. It looked more like celluloid than anything I could think of.

This, however, did not hold us for long. We had been cooped up in the throbbing ship for so long that at first we were numb and unsteady, but now we became conscious of a dull rumble that shook the ground. We could hear a faint roar far to the south.

Matheson now took charge and organized a systematic exploring plan. We were to circle about the ship, ever widening the radius of our circle in the hope of finding something interesting. We armed ourselves, agreeing upon pistol shot signals should we stray too far to be within hailing distance of each other. Martin, the young man in flannels and high top boots, was left at the ship to guard and to take moving pictures, for he was the official photographer of the expedition. The cook remained in the corner of the galley muttering to himself.

I was delighted when I was ordered to go in a southerly direction. That ramble intrigued me. I had gone but a few hundred feet when a clatter of wings startled me. A huge beetle some three feet long, with a set of wings fore and aft, rattled away up into the foliage of the jungle. During our stay we saw many of these, some of them as long as five feet.

Several times I was amazed to see flying worms. These ranged in length from one to seven feet. A row of many tiny wings along each side of their slender bodies sang a high-pitched note as they squirmed and undulated through the air. Strange little furry animals with six legs bounded from before me and disappeared in the underbrush. Other animals were covered with bright, translucent shells. We had expected to find that evolution had produced different species and forms than those of the earth, but these were startling and fascinating.

I had gone what I estimated to be about a quarter of a mile from the ship when I came upon a wide, well-beaten game trail. I examined the tracks in the dust. Some

monster of the jungle with padded feet about eighteen inches long had churned up the dust of the trail. I examined them more carefully. The foot was divided into three parts, each part terminating in an immense claw that dug deep into the ground.

I listened intently, not wishing to meet one of these monsters, but no sound save the drone and clatter of insects and the distant roar disturbed the warm air. The roar seemed no louder than it had from the ship so I reasoned that it must be a great way off and very loud. I was feeling sorry for myself and keenly disappointed when suddenly I stiffened to attention.

Faintly in the distance toward the spot where the ship landed three shots cracked in rapid succession. It was our distress signal. Before I was fairly on my way three more shots rang out from the same direction. I heard others answer from distant parts of the forest.

I ran crashing through the underbrush, guided by the occasional shot from the ship. I scared up myriads of strange insects and animals, stranger than any I had seen on the trip out, but there was no time to investigate them. A monster butterfly, startled and evidently confused, flew into my face and knocked me down in a smothering cloud of silver and gold dust. At last I crashed into the burned-over clearing, panting and gasping for breath.

Five of the men had already arrived when I got there, and stood gazing upward through the hole we had burned in the foliage. I joined the group and gasped. Far above us, glistening in the slanting rays of the setting sun hung four silent, motionless planes. They were gracefully streamlined, large in front and tapering to slender tails in the rear. They were built of a light green substance that had a metallic sheen. There was no sign of wings.

They seemed to be debating something and then as if they had come to a decision, one of them dropped like a plummet straight for the opening we had burned. We scattered among the trees, fearing that the thing might crash. But just above the trees it came to a stop and a package dropped from a little trapdoor in the bottom of the hull. We saw it strike the ground and when we looked up again all four ships had vanished.

● We clustered about the object while Matheson examined it. He untied a thin metal ribbon and unrolled a sheet of very thin green metal. It was like a scroll. He looked at it a moment and then handed it to me with a puzzled expression.

"It's for you to decipher," he said.

"But I'm no good at riddles," I objected.

However, I glanced at the scroll and then looked closer in interest. Only a glance was sufficient to tell me that it was good old Continental Morse code. Evidently they had used a stylus to indent the dots and dashes in the thin metal. I recall that I was shaking a little with excitement and wonder as I rummaged through my pockets and found a pencil and an old letter. On the back of the letter I quickly interpreted the message.

"What does it say?" all the other ten demanded at once.

"Wait till I check it."

I hastily checked it, for I was not accustomed to reading printed code. I read the message aloud so that all could hear:

"MEN OF EARTH, WARNING. GO BACK TO EARTH. WE KNOW ALL ABOUT YOUR CIVILIZATION AND DO NOT WISH IT BROUGHT TO OUR PLANET TO CONTAMINATE OUR LIVES. WE HAVE COPIED YOUR RADIO TALK FOR MANY YEARS AND AT LAST HAVE DISCOVERED YOUR LANGUAGES. WE HAVE STUDIED YOUR CIVILIZATION AND ARE APPALLED BY YOUR MODE OF PROGRESS AND YOUR BRUTAL NATURES. WE HAVE ALL THE ANIMALS WE WISH WITH US. WE DEMAND THAT YOU RETURN TO EARTH AND THAT YOU PROMISE THAT NEVER AGAIN SHALL A MAN OF EARTH COME TO MARS. IF YOU STAY YOU SHALL SUFFER. ANSWER ON YOUR RADIO IN CODE. WE DO NOT UNDERSTAND YOUR SPOKEN WORDS."

The message was signed with a queer scroll that looked like a cartoonist's depiction of smoke coming out of a chimney and then explained by "Earth Languages Expert."

We stared at each other while Matheson reread the warning. The full import did not impress us until Matheson gave us his impressions. He looked up from the message, his intense eyes snapping.

"We came here," he said, "expecting to find life. We have found almost super-human intelligence. A group of minds which can copy the dots and dashes sent by another planet and decipher the language and meaning is something to take seriously. Any pioneer and explorer must expect to meet opposition and hostility. Progress comes from struggle. But I am convinced that our opposition is something that we may not be able to cope with. As leader of this expedition, I do not wish to assume the full responsibility of answering this warning. Suppose that we think it over during the night and in the morning put it to a vote? The question is, shall we go back or shall we defy them?"

The next morning, while the cook was preparing breakfast, we again assembled in the burned clearing. Because of the angle at which the rocket stood we had made our beds on the decks in the angles formed by the bulkheads and decks. Wedged into the angles, we had not slept well and were a grouchy lot. Added to this was the fact that the sun was rising, uncomfortably hot. I mention these things because they aroused within us a feeling of resentment and were the chief factors that influenced our vote. Now as I look back, I have a suspicion that Matheson anticipated something of the sort. I am sure that he wanted to defy the inhabitants of Mars and he knew that twilight was not the psychological time to decide the question.

"Now," said Matheson, stretching the kinks out of his arms and legs, "we should decide what our answer is to be. What is your vote?"

O'Malley spoke first. He was a hot-tempered little Irishman who had shipped as one of the engineers. His eyes were bloodshot from lack of sleep and he limped slightly from a cramped leg.

"Tell the blankety-blank scorpions to go to Hell where they belong. The spawn could have invited us to their city with true hospitality instead of making us spend the night out here like wild animals. The love of the Virgin ain't in 'em."

Others agreed with O'Malley. There was no question about the answer.

"And besides," said Hanson, the big Swede, "we can't promise that no one else will ever come here from the Earth. We all know better than to promise that."

"We could promise that if it would do any good for us now," said Macey. "But I vote we tell them we're here as long as we please."

"Thanks," said Matheson. "I am pleased with your unfaltering loyalty and your answer."

And I know that he was pleased—more pleased than he cared to express. As for myself, I voted to stay. But I have a confession to make. I had lain awake almost all night thinking about it. I tried to imagine myself on the earth copying dots and dashes from another planet and then having the intelligence and mental power to figure out what the totally unknown language meant.

As I began to realize the full significance of this I tried to turn it to our account. Frankly, there lurked in me the fear of the return trip. I almost hoped that they would destroy the rocket ship so that we couldn't return. It was that strange mental inertia at work again, for now we were located in a sense. I tried to make everything argue in favor of remaining.

Then I thought of what we on the earth might do if some unwelcome invader came with ideas and methods which we regarded with abhorrence, as the Martians evidently regarded ours. But I thrust these thoughts from my mind for they hinted that we had better return while we could. I was more afraid of the return trip than I was of all the intelligence and threats of the Martians. I feathered my ideas with soft thoughts, trying to convince myself that beings of so high an order of intelligence would not stoop to violence. Fairy tales and blind hope are the meat of explorers.

But back to our meeting. We discussed the situation further. It was Drummond, the second in command, who was speaking.

"I move that we tell them that we want a few days to consider the matter. That will give us a respite. We might learn more about them and possibly institute some form of defence."

"I believe that it might be to our advantage," said Matheson. "An excellent plan."

We agreed to this diplomacy. All, that is, except O'Malley. He was still fuming. He slowly clinched his huge red-haired fists.

"Why wait? I'd like to break one of 'em in two with my bare hands and spill the fire and brimstone out of his rotten carcass."

"I know that you are spoiling for a fight," said Matheson, "but you are overruled."

He turned to me, while O'Malley grumbled to himself. "You will please send this message: 'WE WISH A DAY OR TWO IN WHICH TO CONSIDER YOUR WARNING. EXPECT A DEFINITE ANSWER LATER.' Tell them that in as many different ways as you can think of so that they will be sure to understand. And better take a reading of the direction finder."

I went to the ship and dragged myself up its steep decks to the radio shack. After lighting the tubes in the transmitter I hammered out a call to the Martians. I turned the tuning dial of the receiver slowly and then came the answer on the exact wave I had used in sending the call. "GO AHEAD" flashed back at me in high-pitched, staccato dots and dashes. I sent the message, repeating it in different words and then signed off. "WAIT" the mysterious operator flashed back. Wait I did. For fifteen minutes I sat there with the 'phones clamped to my ears. Suddenly dots and dashes shrieked in my ears. I copied the answer:

"WE KNOW THAT YOU CAN NOT MAKE UP YOUR MINDS OR CONCEIVE IDEAS QUICKLY. THE COUNCIL VOTES THAT YOU BE GIVEN TIME TO CONSIDER. WARNING: STAY WHERE YOU ARE.

(Signed with a chatter that was probably that cartoonist's smoke and then:)

EARTH LANGUAGES EXPERT"

I had twirled the loop and reflector of the receiver and found that the messages were coming from the north.

I slid down the decks and ran out to Matheson to whom I gave the message. He read it and then handed it around to the others.

"And the direction?" he asked.

"About two degrees west of north," I said.

"The station is located about two degrees west of north," Matheson addressed the group. "Remember that. And now we have our comforts to consider. We should build a shelter. We can't very well live in the rocket, tilted as it is."

We fell to work as soon as breakfast was over. Some distance from the ship we found two trees with conveniently located crotches. In these we rested a log for ridgepole. For walls we cut logs and stood them on the ground and rested the upper ends over the ridgepole. It looked more like a tent than a log cabin, but it was quickly built. While we worked at this, Von Holtz, the heavy-featured German chemist, found a large spring close by and after analyzing the water pronounced it fit for use. Although the water was milky white as it emerged from the ground, due, Von Holtz said, to a large carbon dioxide content, it cleared after standing a short time.

With the ring of the axe and saw our spirits rose. We were doing what contented us—bending nature to our needs. O'Malley bubbled over with "Annie Laurie" in a pleasing tenor voice and others joined in. Matheson was a bundle of energy. Like a bird, he was everywhere. At times he seemed to us to be fussy, but really it was his indomitable spirit tempered with a powerful mind that anticipated and provided for everything. It was only later that we realized this, together with some measure of the true and unselfish spirit of the man. He was a giant in a wiry little body.

By sunset we had provided our heavy tent with a crude fireplace and had moved some of our stores from the ship. I had strung a pair of wires from the ship's little lighting generator and hung a single two-hundred watt lamp in the center of the room. By the time the chill of night settled upon us a merry fire was burning on the hearth and the cook was mumbling over a pot of stew. After supper Matheson opened the conversation.

"We should explore tomorrow," he said. "There seems to be little danger of any kind of attack, so we can feel free. That rumbling to the south interests me. Suppose we go in that direction and find the source of the sound?"

That sound had been the topic of conversation and remarks many times during the day and we were all eager

to learn its origin. After discussing and planning we decided that we should all go. We even decided what each should do and carry, and settled other details before we rolled into our blankets for the night.

CHAPTER III

Tragedy!

● I waked next morning to find Matheson and the cook and the sun already up. Breakfast was ready when we rolled out of our blankets. In an amazingly short time after eating, each had selected what he was to carry and we were on our way. I recall that I carried several tins of film for the moving picture camera, a rifle and pistol, and two tins of butter for our lunch.

We plunged into the thickets, following the route I had gone the first day. We crossed the game trail and plunged deeper and deeper into the jungle. The trees became larger and taller as we advanced and the underbrush became less and less troublesome. That was probably because the monster trees cut off the sunlight from the shrubs. Now we could hear that the roar was perceptibly louder and nearer. We crossed two more game trails. Once we heard a distant crashing as if some heavy body were tearing through the brush but the sound was receding so we continued on our journey.

We scared up myriads of strange insects, small animals and weird birds as we penetrated deeper into the forest. Jones, the stocky naturalist, wanted to stop and study these new forms of life, but we overruled him and continued.

The roar was becoming so loud now that we were forced to shout to each other. The ground trembled. It became damper and in some places we encountered swamps. A fine mist hung in the air.

Abruptly and without warning we came upon the bank of a great stream. We instantly guessed that it was a canal for it was perfectly straight as if it had been surveyed. The water was running swiftly. Over its surface buzzed thousands of huge insects, some like the ones we had seen and others that were strange to us. Occasionally the water was broken by a splash as some strange fish leaped up and caught an insect or flying worm.

Downstream the air was heavy with mist. A slight breeze blew wisps of fine vapor into our faces. We followed the stream down until we came to the edge of the cataract. The mighty canal plunged some three hundred feet down into a huge basin. Through the banks of mist we could see another cataract emptying into the same basin. Evidently this was the junction of two canals. Half a mile downstream, in the bottom of the basin we could see the remains of a building.

"We should explore that building," Matheson shouted above the roar.

Speech was next to impossible, so in silence we skirted the rim of the basin until we came to a fault in the cliffs and descended into the bowl. At the bottom Matheson brushed against a small plant that looked something like a cactus except that it was red. He tried to pull away but was held fast. I examined his leg and the plant. The spines bristling from the pads were viciously sharp and barbed. Three of them had sunk into the mathematician's knee.

Being an electrician, I had acquired the habit of carrying a pair of side-cutting pliers in a little holster on my belt. Carefully avoiding the sharp pines, I cut through the tough, horny needles and freed Matheson. While he writhed with pain I grasped the stubs in his leg and jerked them out. The barbs tore away some flesh and skin when they finally let go.

We waited until the pain subsided somewhat and then continued toward the building, the stocky naturalist half supporting Matheson. As we neared the structure we saw that it was constructed of huge blocks of brown stone carefully matched and put together. It was dry here for we were beyond the range of the mist. Weeds and brush grew up against the stones and we had to force our way through these to get through one of the doors. Evidently the Martians were small in stature for we were forced to stoop to get inside.

Two rows of massive stone columns supported the vaulted ceiling. Between these was a battery of strange machines which claimed my attention. While Martin loaded his movie camera, and Jones, the naturalist, after one glance went outside, the rest of us roamed about the building. There were twenty of these machines. The main part of each consisted of a sphere about thirty feet in diameter. There was no evidence of wiring so I concluded that if they were electrical generators they sent the current out direct by radio. As we know now, this guess was correct. But these machines had been abandoned. Much of the machinery was covered with rust. Other parts were bright and polished as if they had just been made.

I kicked at the rust on what had once been a massive frame. The rust came off in thick flakes, revealing a small bar of bright metal in the center. I called Matheson.

"See," I said, "the rust is four or five inches thick. They haven't used this plant for centuries."

"They evidently have some other source of power," said Matheson. "It makes me wonder."

I was going to ask him what he wondered about when we were interrupted by a shout from O'Malley who burst into the room. He had evidently wandered outside while we were inspecting the plant.

"Mother of God!" he shouted, his eyes round with excitement. "Come and see!"

● We shouted questions at him but he was gone. The others ran out while I helped Matheson, who still limped painfully. We found the crew gathered about the naturalist down on the rock strewn shore. They were talking excitedly. When they saw us they clustered about us.

"Gold," said Jones quietly, holding out a small nugget. "The stream bed is yellow with it."

Jones seemed not particularly interested and wandered off while we examined the nugget and cut shavings from it with our pocket knives. We went to the edge of the water. Indeed, two or three days of panning would have netted a king's ransom. I thought of the soft, thin metal scroll and the green ships and wondered if gold, since it was plentiful here, was not used for a variety of things.

"Mother!" breathed O'Malley. "Now we can be rich! Now I can buy the old lady all the fine rags she wants. When we got married all I could afford was a plain gold wedding ring. I always wanted to get her a real wedding

ring set with diamonds. Now I can get her a real platinum one with diamonds as big as grapes. It'll make the old lady happy."

Jones, who had been wading and probing about a short distance from shore now joined us again. In his hand he held two spheres the size of peas. They were a beautiful opalescent green in color and of a soft satin finish.

"Pearls," he said shortly and returned to his exploring while we admired the little globules.

The others spread out along the shore, picking up little nuggets. I examined Matheson's knee.

"It is done," Matheson said. There was something in his voice that startled me and I looked up at him. I thought that he referred to the ugly blue swelling that was setting in about the cactus wounds, but his eyes were staring as if at something in space.

"Just what do you mean?"

He jerked back from his reverie. "Don't you understand? The wealth. It will finance and stimulate trade and exploration. Interplanetary travel has become a reality. Explorers and pioneers will come. A new area in the march of civilization is here."

But I was more interested in the condition of his leg than in areas of civilization. "I think that we better get back to the ship and treat this leg. Hey, Jones," I called. "Come here."

Jones, who had begun his schooling with medicine in view before he was sidetracked by his interest in nature, served the office of physician as well as naturalist. He came up questioningly.

"What do you think of that leg?" I asked.

He examined it and shook his head. "I think that we better get back to the medicine chest."

"Let the men pick up some more gold," said Matheson. "The more they bring back the better it will be for the future."

"But we can come back later," Jones objected. "It is more important to treat that leg now."

It was difficult to pry the others from their treasure hunting but at last we were loaded and on our way. We climbed out of the bowl and struck off through the forest, using our compasses, which we had discovered pointed about northeast. As we progressed Matheson limped more and more and his face became twisted with pain. When he had covered half the distance he collapsed and could walk no farther.

We found that his leg had swollen so badly that we were forced to slit his trouser leg to relieve the pressure. We constructed a rude stretcher by slipping two poles through the sleeves of all the coats we could gather from the crowd. With two men carrying Matheson, we again struck off through the forest.

The sun was setting when we came up the last game trail. We advanced along this until we came to the stone marker we had set up when we first struck the trail. Again we forged through the underbrush. At last we sighted the burned and blackened foliage of our clearing and were soon in our rude shelter.

We made Matheson as comfortable as possible and Jones washed the wounds with antiseptic and applied a poultice. Utterly weary, despite the lesser gravity of Mars, we rolled into our blankets immediately after supper and regular breathing told me that the others fell asleep almost immediately.

But I could not sleep soundly. I tossed about, sleeping and waking fitfully. I was worried about Matheson, or perhaps I should say, worried about what would happen to us if he should die. I dozed for what seemed but a few minutes and waked with a start. The light was turned on. I glanced at my wrist-watch. It was midnight. Matheson was lying propped up with coats and pillows busily writing in his notebook. His face was drawn and creased with pain.

I lay thinking for a time and then a thought struck me sharply. Quickly I slid out of my blankets, dressed and went over to Matheson.

"How do you feel?" I whispered.

● He looked at me for a moment and his eyes softened. "Thanks for thinking of me. My leg is quite painful and the pain seems to be spreading. But there is nothing that you can do for me so I think that you better go back to bed."

"I have an idea," I said. "Why shouldn't I radio the Martians. They seem to be listening in at all times. I'll describe the plant as best I can and ask them what to do for the wounds. I know that it sounds foolish, but they seem to be a rather decent lot."

Matheson's tense eyes brightened with new hope. "Do that, Nordstrom! It can do no harm." He sank back wearily. "And perhaps no good."

I hurried out into the night, lighting my way with a flashlight. It was the first time that I had been out in the Martian night. But buzzing and chattering of the jungle day had given way to strange croakings and sinister rustling of the night. Giant fireflies streaked through the air, some with their lights turned on continuously, other smaller ones flashing intermittently. Two and three-foot worms emitting pale green light crawled along the ground.

I hurried through the vibrant night to the ship and turned on the lights. I dragged myself up its canted decks to the radio shack and turned on the current to the transmitter. When the meters settled to normal I pounded out a call to the Martians. Almost instantly came the answer out of the mysterious night. I described the plant and asked what could be done. The word "WAIT" cut sharply through the murmur and crackle of static.

I lighted my pipe and settled down to wait, listening to the strange sounds that came over the set. There was something eerie about the Martian night. As I listened more intently, the background of noise in the 'phones seemed to come up out of darkness. I could distinguish strange buzzing and crackling. I thought that I distinguished a voice but it must have been my imagination. I wondered where those sounds came from. Probably from electrical disturbances originating in Martian atmosphere or even cities. Some may have come from remote places; perhaps even the earth. Home, thirty-seven million miles away. But a bright speck among other bright specks in the sky.

I began to lose myself in this new world of sound as I often did when I was listening to nothing in particular, when I was startled out of my abstraction by the sharp whistle of the Martian transmitter. Instantly the mysterious sounds of the ether snapped back into the darkness and I copied the bright, staccato jabs of sound. When he was through I reread the message:

"THERE IS NOTHING TO DO FOR THE STING OF THAT PLANT. DEATH ALWAYS

COMES IN SIX TO EIGHT DAYS.

WE MUST HAVE YOUR ANSWER BY SUNDOWN TOMORROW. WILL YOU LEAVE OUR PLANET AND PROMISE THAT NO EARTH MAN SHALL EVER COME HERE AGAIN OR SHALL YOU SUFFER? IF YOU DO NOT ANSWER BY THAT TIME WE SHALL KNOW THAT YOU DEFY US.

EARTH LANGUAGES EXPERT."

Mechanically I turned off the current and laid aside my 'phones. I sat staring at the message without seeing it. Death was creeping upon us. We would be left alone in a strange jungle—alone in limitless space. I left the ship and stood in the darkness. The sounds of the jungle night had changed to a hushed death chant. The fireflies and stars were like candles before a bier, flickering in a chill gust of nameless wind. I tiptoed to our cabin and gently pushed the door open. Matheson was still writing.

I had an impulse to hide the message without showing it to him. But no, Matheson was no baby. He must know—probably know already. I handed him the paper without a word. He read it and smiled at me. There was a strange look of resigned triumph in his eyes.

"I knew this before we were back this afternoon," he said. "That is why I am bringing my notes up to date. Will you promise to care for the notes and, if you get back to earth, have them published?"

I nodded. I could say nothing.

"And there is another thing," he added. "Say nothing to the others about this. Don't let them suspect. Except Drummond. He should know. Will you wake him, please."

I tiptoed among the sleepers and shook Drummond gently. He opened his eyes and stared at me. I put my finger to my lips and nodded my head toward Matheson. He understood. He crept silently out of his blankets and came over to the bed. Matheson handed him the message. Drummond read it with an alarmed and puzzled frown.

"Nordstrom radioed the Martians about the plane and asked them if anything could be done for the poison," Matheson explained. "But what shall we do about the warning? We voted."

Drummond nodded. "We voted. But now it is different."

I saw Matheson's face grow haggard with disappointment. I suspected that he had set his soul upon defying the Martians. Just why, I did not know at the time.

"We voted," I said. "It seems to me that it is all settled."

"We're here to learn what we can," said Drummond. "I feel that we should go ahead as we originally planned."

Matheson's eyes glowed. "Then that is settled."

"Yes, that is settled. I'd suggest, Nordstrom, that you slip into your shack and radio our answer some time tomorrow. We are here and we propose to stay just as long as we wish."

"Good," said Matheson. "Now, if you gentlemen will go back to bed I think that I'll be able to sleep a little. You better burn that message."

I tossed the paper onto the glowing coals in the fireplace, turned off the light and crawled into my blankets.

CHAPTER IV

More Tragedy!

When I waked next morning the sun was shining through the cracks between the logs. Several of the others were up. They tiptoed about, speaking in hushed whispers. Matheson was sleeping fitfully, groaning occasionally. But there was a smile on his lips. After breakfast we all went outside where we would not disturb him.

The day dragged itself along. At eleven Matheson again resumed his writing after drinking some broth. He was weaker now and often stopped to close his eyes and rest. In the afternoon Drummond nodded to me and I slipped away to the radio room in the ship. I flashed my message and waited for their reply. Nothing came but that mysterious, haunting background of sounds. Evidently they would deliver their answer in some other way.

For a long time I sat before my instruments wondering what might happen. I wondered what we of the earth might do in a similar case. That was plain, but I could not imagine myself in the place of a Martian for I had never seen one. I went back to the log hut to wait. There was nothing to do but wait. Matheson was dying. We had but to wait like vultures. The air seemed charged with Martian dynamite.

Nothing happened during the day. We stationed a guard during the night but nothing happened. Matheson groaned in his sleep. At three o'clock Von Holtz shook me gently and I relieved him as guard. I went out into the night and stood before the door of our hut, listening to the melody of the jungle. New sounds seemed to come up only to drop back into the general chorus. Fireflies streaked their pale phosphorescent glow among the trees. Far in the distance I heard a crashing of underbrush. Slowly it faded away in the distance.

Suddenly there was a hush in the sounds about me. I slipped the safety catch on the rifle and listened. My flesh puckered with a vague feeling that someone was near and was staring at me. I listened intently, yet no sound broke the stillness. I tried to probe the darkness but could see nothing. Even the fireflies had turned off their lights.

For minutes that seemed like hours I stood as a statue, my rifle ready. Some animal started chirping. Others resumed their song and the chorus of the jungle swung into full volume. The fireflies turned on their lights.

Slowly the eastern sky was flushed by the dawn. As it became lighter the eerie songsters of the night grew silent and the busy, chattering tempo of the day began. When I could see in the dim light, I began to explore, looking for signs of visitors. I circled the hut but found nothing. As I approached the burned clearing, however, I stopped short. I rubbed my eyes. I must have uttered an involuntary shout for in a moment I was surrounded by the rest of the crew.

Our ship was gone!

We stood there without speaking, soaking in the full measure of the tragedy. It trickled through us, stimulating our imaginations. I pictured us remaining here and slowly dying off. I wondered who would be the last to die. Slowly we recovered our wits and began to search for some sign of the invaders. No one spoke. I felt

guilty, for I had been the one on watch when the ship was stolen. I wished that some one would accuse me so that I could have explained that there had been no sounds. But no one accused me. A hot argument would have suited me. Anything but this stunned silence.

We circled the spot, seeking vainly for signs of visitors. It was evident that the ship had been picked up by one of their silent ships and carried bodily away. We filed back to our cabin like a funeral procession. Drummond told Matheson briefly what had happened. He did not mention the fact that I had been doing guard duty when the rocket was stolen. The news did not dismay our leader.

"Who was on guard?" he asked.

"I was," I said. "From three until daylight."

"Did you hear anything?"

"Nothing. There was a lull in the sounds of the jungle just before daylight. I suppose that that is the time they came."

"Probably. You saw nothing of the ship?"

"No. If I had been close to the rocket I probably could have seen it against the stars, but you know, we can't look up through the hole from here. And I expected that they would attack us."

"Surely. Perfectly natural to think that. I fancy that the other guards kept close to the cabin to protect us too. Is that not so?"

"That was my thought," said Von Holtz. "It was in my mind to protect the sleepers. It might have happened while I was standing guard as well as during Nordstrom's watch."

● Perhaps I was feeling alone and guilty and a little sentimental. At any rate, something warm surged through me at these words. I determined that from now on this German chemist should get the best of everything, at least so far as I was concerned.

"Well, there is no use wasting time like this," said Matheson. "We shall have to face the facts. And we will."

We had faced the situation in a vague and stunned fashion, but Matheson did not mince words.

"We have stores for only two days. If we ration we might make it last four at most. If we remain here we are lost. In a case like this the most logical remedy is to carry the fight against the enemy to his very door.

"We know that there is a city or some center of population almost due north. All of our negotiations were carried on through a radio station located there, at least. It is reasonable to suppose that the authority for these demands and the answers to our questions came from some person or body close to the station.

"But we don't know how far we shall have to go. So we have food to consider. We noticed fruits of various kinds hanging from the trees and shrubs. Von Holtz, are there enough chemicals left to analyze them? We'll have to determine whether or not there are any fit for food."

"Most of our chemicals are on board the rocket," said Von Holtz. "There happens to be some left after I analyzed the water. Enough for only a rough test."

"Then I suggest that we spend this day preparing for our war. You gentlemen gather all the species of fruits that you can find and then Von Holtz can check them. We'll make ready today and in the morning begin our trip. When we get there we'll try to negotiate with them peaceably. If that fails, well, we must get back to the earth."

When we came back from finding the rocket missing that morning I thought that I should never care to eat again. But breakfast was something to be enjoyed now. We all felt enthusiasm and ate heartily. There was action in sight. We were invading nature again.

After breakfast Jones dressed Matheson's leg. The swelling had subsided somewhat, leaving his leg an ugly blue, streaked with scarlet. I said that the swelling had subsided. In reality it had shifted upward and now his thigh and hip was so swollen that the skin was tight and shiny. The flesh about his knee seemed to have softened and looked as if it might drop from the bone.

"We'll have to make a good stretcher too," O'Malley was saying. "We can use a blanket and make it comfortable."

"We can make that tonight," said Matheson. "The main thing now is to find out how much we can depend upon the jungle for a living."

"And when I get my two hands on one of 'em—" O'Malley rumbled. "Let's get under way."

We were filing out when Matheson called me back to him.

"Would you help me to a more comfortable position?"

I helped him move to one side. He closed his eyes in pain but smiled his thanks.

"I have completed my notes," he said. "Here they are. I want you to take care of them as you promised. Make it your responsibility. If I try to carry them with me on the stretcher they might be lost. I'll keep this tablet and pencil in case I should think of something else while you are out foraging."

"Is there anything else that I can do for you?" I asked. "Perhaps one of us had better stay with you."

"No thanks. If I need anything else I can call the cook. He is a very good nurse if I tell him exactly what to do."

I hurried and overtook the others. For hours we worked, gathering specimens. We concluded that the ripe fruits were the soft ones and selected a perfect sample of each. By noon we had about thirty specimens.

We were working our way back toward the cabin, somewhat scattered. Occasionally we shouted to each other. When we were close to our camp we were startled by the smothered report of a gun. We drew our pistols and crashed through the brush. We approached the cabin cautiously. There was no evidence of invasion. Guns in hand we crept up to the door and peered in. The cook was crouched by the fireplace muttering as usual. Matheson lay limp upon his crude bed. One hand hung over the edge and on the ground under his hand lay an automatic.

We filed into the room to his bedside. From a powder smudge on his temple trickled a little stream of blood. On his chest was a note and the pencil. On his lips was a smile.

Drummond took the note and read it silently. We stood waiting. He stood staring at the paper, his shoulders slowly stiffening. Without a word he handed the note to the next man and stood like a statue. We handed the paper around. My hands trembled when it was passed to me, and I read:

"Gentlemen:

"I am grateful to you for your friendship and courage and loyalty. But now has come the time to part. You have work to do. Mine is done. In our position the dying cannot burden the living. Bury me and forget me; we have no time for sentiment. Turn your faces to the future and carry on. And good judgment to you. Good-bye. Matheson."

● I felt sadness. But more. I felt a strange thrill. It was as if Matheson had seized a burning brand from the fires of civilization and charged into the darkness beyond the light of knowledge. His wiry little body had become a flaming beacon to light the way for oncoming hordes. He had marched forward with indomitable will. To forget persons and go forward relentlessly. To die that others might still go forward.

Drummond, being of a poetic and sensitive nature, must have felt this too. I'm sure that he did. There was a new light in his eyes and a new set to his jaw. He shouldered Matheson's burden with all its original fire. But there was a difference. Matheson had kept his feelings under the leash of a powerful intellect and tempered it with kindness and human sympathy. But Drummond let go. Like Matheson he became indomitable. Unlike Matheson, he became relentless and cruel.

We scooped out a shallow grave in the center of our cabin. We wrapped the body in a blanket and gently lowered it.

"We should say a word," said O'Malley, crossing himself.

Drummond turned on him fiercely. "Say a word! Fool! Scum like we are can think of nothing worth saying over a man like Matheson! His actions speak more than we know. Cover him up."

O'Malley lost all his fighting instinct before those flaming eyes. He grumbled something about devils and fell to work with the rest of us. We filled the grave and covered it with flat stones. We put the note in a bottle and corked it tightly and placed it in the monument. We are ready to go on.

The rest of the day we busied ourselves making packs while Von Holtz tested the fruits. The food was divided equally among us. Besides food, each man was to carry half enough blankets and double up in bed at night. All other equipment was to be left except an axe and a nest of pots which the cook was to carry. Martin wanted to take his movie camera but he was overruled. He tried to satisfy himself with a pocket camera and several rolls of film. By dark we were so organized that each knew exactly what he was responsible for.

Von Holtz had completed his check of the fruit. There were ten or twelve varieties which he pronounced as probably edible. After supper each of us selected a fruit and cut it in two. We ate one half and kept the other for identification. It was the final test. Mine was a rough, red fruit about the size of a cocoanut. The rind was tough and hard but the inside was sweet and juicy. I tasted the blood red pulp gingerly at first. It tasted like a most delicately flavored muskmelon.

Dawn was lighting the eastern sky when we crept out of our blankets next morning. After ordering the cook to make breakfast we compared notes on how our various fruits had agreed with us during the night. There were no ill effects except in the case of Macey, one of the engineers, a rocket and explosive expert. He said that he had spent a long night of delightful dreams. Ordinarily he was a silent, moody fellow, morally unfit for pioneering, but now he burst into occasional song. As we sat about Matheson's grave and ate breakfast Macey amazed us by cracking jokes. His spirits were soaring.

We discarded from our menu the little black seed pod he had sampled. It contained a habit forming alkaloid which later made a fortune for Macey before the Earth government put a ban on its importation. It was the drug that furnished synthetic courage to men like Macey during the terrible struggle that preceded the fall of Mars.

Each gathered up the pack he was responsible for and after a last glance at the lonely grave in the center of the cabin, we filed out and began our march. For two days we struggled through underbrush, sometimes in the cool damp shade of the great trees, sometimes under the blistering heat of the sun when we crossed barren knolls of rock and gravel, always cold and freezing during the night. O'Malley grumbled and threatened and grumbled some more. If he could have had a good fight he would have felt better, but fortunately, none of us hazarded a bout with him.

Macey became morose and silent, now that the effect of the drug had worn off. We were looking for a camp for the second night when I saw Macey pick one of the black seed pods and eat a part. In a few minutes his step became lighter and he began to sing heartily. O'Malley quit grumbling and cursing and joined in. They slid into a lively march tune that seemed to pick our feet up by the rhythm.

CHAPTER V

The Curse of Mars

● We came across one of the game trails and stopped to rest on the cleared ground. While we were wiping the perspiration from our faces Macey sat nearby in laconic good humor.

"Isn't life perfect!" He stretched out in the sheer ecstacy of his alkaloid heaven.

"That Devil's brew put you in hell and you don't know it," said O'Malley, shaking his fringed head.

Macey burst into happy laughter. "'Heaven and Hell are within.' Don't you know that? And I'm happy so I'm in Heaven."

O'Malley glared at him. "And now I know it. You talking sacrilege. It's talk that smells of fire and brimstone, I'm telling you."

Macey snapped his fingers airily. "You're the one squirming in Hell, you big bruiser. Fancy people in Heaven spending all their time cursing and spoiling for a fight! Now look at me. All the world is a song and I'm directing it."

"Anyway, we don't need that Devil's brew to keep up our fight," O'Malley returned. "It 'ud been better for the soul of you if we'd left you home."

Evidently the thrust hurt for Macey's hand twitched over his holster. Von Holtz, evidently sensing, as did the rest of us, that the argument was slipping out on thin ice, began to sing "Annie Laurie" in his fine bass voice.

It was too much for O'Malley and his tenor switched from argument to song.

The others joined, relieved at the turn. All except me. I couldn't sing a note, and being one of those rare fortunate ones who knows himself to that extent at least, I lighted my pipe and settled down to enjoy the chorus. Indeed, had we all been musical mutes at that time we might have avoided tragedy in one form if not in the other.

I thought that I heard something to the east, but the song had gained in volume. They were letting off the steam of taut nerves. Macey especially. He led with all his might. Again I thought that I heard a crackling and looked down the trail just in time to see a monster choking the wide game run and coming toward us. For a moment I froze solid. Now as I look back I realize that it was the same paralysis one feels while standing on the track in front of an approaching locomotive.

I shouted, or perhaps I screamed. The music stopped abruptly and we leaped into the brush beside the trail. Over my shoulder I had a glimpse of the monster as it thundered by. It was like a gigantic lizard of some antidelavian period. When I saw that it continued without slacking its speed or looking to right or left, I stopped and swung up my rifle. Now I realized fully the size of the monster and decided not to shoot.

The others had stopped now and we stood, waiting until those pounding feet and that lashing tail had grown faint in the distance. I picked up my pipe where it had fallen when I decided not to shoot and struggled to relight it, willing the trembling match to stay over the pipe bowl. There was no strength in my knees. Yet I felt a little triumphant when I finally got my pipe going nonchalantly and looked up at the others. They were white and trembling. Macey alone was unaffected. He chuckled.

"Isn't he the affectionate pet? Now if we could roam the carefree—say, where's the cook?"

There was no evidence of the cook. We listened but could not hear his muttering. It was with foreboding that we went back to the game run. At the edge of the trail we stopped in silence. Even Macey was sober for a moment. We went over to where the cook had been sitting. He was flattened and battered into the dust and dirt of the trail. He had been carrying the cooking utensils and the only axe we had taken along. We salvaged two pots that had not been battered flat and the two blankets. We spread one blanket and rolled the body onto it and gathered up the corners.

"Here's the axe," said Jones. "Fortunate for us that he leaned it up against a tree out of the way."

We carried the cook some distance from the trail to an outcropping of gravel where we laid him gently down. There was no shovel with which to dig a grave so we decided to pile rocks on the body.

"He died twice," said O'Malley reverently.

Affectionately Macey patted one of the cook's cheeks that happened to be intact, and chuckled. "You're a good boy, cook. We understand each other now, don't we. The others think that life is serious and that progress is something to bow down to. But we know better, don't we old boy? We know that their precious progress is nothing but an avenue of graves. We know the secret, don't we?"

"You'll be talking that way, you spawn of Hell!" O'Malley threatened, his hairy fists bunched into sledges.

"Stop!" Drummond snapped. "I'm getting tired of you two yapping at each other. If you continue to disrupt our march I'll shoot one of you. We are on our way and we're going through. Now stop fussing and cover him up. We're only wasting time."

● In silence we covered the body with rocks. I don't know what the others thought about, but I wondered how long it would be before I filled one of Macey's "avenues of graves." Avenue of graves. The phrase stuck in my mind. After all, what difference whether I filled one sooner or later? It would surely happen somewhere along the road. There was something about this Martian jungle that made me see things from a different, a hard-boiled, point of view. I tossed the last rock on the grave.

A spring bubbled out of the rocks a short distance away and since it was almost dusk we decided to camp for the night. As soon as we were settled and supper over, Macey took from his pocket what was left of that black seed pod. Before he could eat it, however, Drummond seized it and threw it far out into the jungle.

"Fool!" he snapped. "You don't know where that is leading you."

But the cheer from the last dose had not worn off. Macey smiled cheerfully. "Ah, my dear Drummond, you don't know how pleasant it is to laugh and sing on the brink of the grave." He looked at O'Malley with a tantilizing smile. "Especially when we die out here so far away from Heaven."

"You spawn!" O'Malley roared, bouncing to his feet. "I—"

"Shut up!" Drummond hissed. His eyes were blazing dangerously and his automatic was half out of its holster. "Now listen, you two. We're in a desperate situation. But, by God, we're going through! Get that! We're going through! If either of you blocks our way I'll shoot him down like a dog. We'll stop at nothing. Get that! If anyone gets in the way we'll grind him into the dust and go on. Now shut up."

O'Malley subsided with a curse while Macey shut his mouth into a laconic grin. We who had been listeners to this warning realized that Drummond meant every word of it. I crawled into my blankets and thought it over. We had been singing and cursing and sweating and freezing as we advanced. Our immediate discomforts had deadened our minds to our situation. Now I realized fully what we were up against. Behind us was Drummond, relentless, and ready to drive us at the point of a gun. Before us—I thrust it from my mind. Madness is always near.

Strangely, I thought of the "Millstones of the Gods." We were between millstones. Slowly they were grinding us to desperation or to death. Perhaps the others thought of something like that. Whatever they thought, we were all very silent. Jones and I had doubled up our beds. Now he crawled in without a word. It was a long time before his regular breathing told me that he was finally asleep. I lay away long into the night watching the huge fireflies and listening to the sounds of the jungle.

I saw something more. I looked beyond the fire and there was Macey creeping silently away into the jungle. I knew that he was after his precious weed but I said nothing. It was none of my business and I did not

wish to mix into the quarrel. I fell asleep before he returned.

We were on the march at dawn next morning. We had spent a miserable night on the hard ground and in the cold. Now the intense heat of the day burned our skins and left us still cold inside. Macey, however, had evidently dreamed well. He hopped along, reciting poetry and singing. Occasionally he made us laugh with stories that needed laundering. But his high spirits were contagious and helped to relieve our misery.

Thus we struggled on for another day. The trees were becoming larger and the underbrush thinner. Traveling was easier. The next morning we came upon another canal which flowed from east to west across our path. It was, we judged, five miles across. The current was swift and oily.

"There is nothing to do but make a raft," said Drummond. "Make camp and get to work."

We had been supplanting our store of food with fruit, but we were running low. Every minute counted now. We fell to work. Drummond delegated O'Malley as axeman. The Irishman had swung an axe before. Jones selected a species of tree that was very light and easy to cut and the powerful O'Malley began to cut sixteen-foot logs from twelve-inch trunks. As fast as he cut them we skidded them to the edge of the water and bound them together with tough vines, gradually pushing the growing raft into the water. We made sweeps from long poles and tied them with vine ropes across the top of a low railing on each side of the raft. Now we could stand along each side and operate the sweeps.

O'Malley was getting out the last log when we heard him yell. There was fear in his voice. With drawn guns we ran to where he stood. He was pulling at something and then he lurched backward when it let go. We surrounded him, all questioning him at once. His face was white beneath the reddish tan. He pointed to the ground.

It was another of those wicked cactus like plants with the savagely barbed spines.

"I—I must have stepped on it," he gasped. Then his lips parted in a white grin. "But-you didn't have to cut me loose anyway."

We examined the leg. A dozen spines had entered his flesh. When he pulled himself free some of these had torn out, leaving ragged wounds. Others had broken off short.

"And so far from Heaven," sighed Macey.

"You spawn," growled O'Malley savagely, forgetting his plight. "I'll kill you with my bare hands!"

"I don't know what to do about it," said Jones quietly.

"Do!" roared O'Malley with a triumphant glare at Macey. "Shoot me, somebody. We can't pack carrion with us."

● Whether O'Malley meant it or not we never knew. A pistol shot roared sharply in our ears and slapped viciously against the surrounding trees. O'Malley slumped and his knees gave way. For an instant his eyes were round with surprise and then they went dead. He fell like a sack of meal over Jones who was still examining his leg. Jones tipped him off and stood up. Drummond was holstering his gun.

We were stunned, more by the suddenness of the sound than by the deed. We realized that it was the best thing to do, for O'Malley would only have suffered intense agony and died anyway. Our desperation had dulled our sense of pity. We did not pity O'Malley now. And Drummond's sudden action dulled it still more for we felt more acutely than ever that we were between millstones. It was with a sense of relief, after visioning ourselves carrying him, that we prepared to bury him.

"O'Malley," said Macey affectionately, "you were a good scout after all. A man after our own hearts. I loved you all the time we were having our little fun. But don't worry old man, we'll lower you gently into our avenue of graves. So long and good luck."

We emptied O'Malley's pockets. He still carried the nuggets he had picked up at the power plant. Perhaps two hundred dollars worth. For his "old lady." I put them into my pocket. I wondered if I would live to give them to his "old lady." I would tell her that O'Malley had intended to buy a new wedding ring for her. A ring set with diamonds. To make her happy.

"Wedding rings and avenues," Macey chuckled.

After piling rocks on O'Malley we finished our raft. Thanks to O'Malley's strong arms we completed our raft sooner than we had hoped. As the sun was still high we loaded our raft and shoved off. Drummond stood at the prow with a rifle while Jones covered the rear. We were not sure what sort of monster might rise from the swirling water and attack us. When we got out into the current it felt as if an unseen hand seized us and swirled us downstream. We pulled heavily at the sweeps and made headway toward the opposite bank, but we made more headway with the current.

A swirl of water caught us and twisted us around end for end like a feather. Instead of turning the craft around again we merely pulled the other way. We were in the middle of the canal when another accident occurred.

Hanson, a husky, tow-headed young Swede, was rowing at the extreme forward end of the raft. His sweep bent rhythmically under his powerful strokes. The vines binding his oar to the railing were chafing and now they snapped under the strain. He staggered, tried to regain his balance but was too near the end of the raft. He went overboard with a splash. We stopped rowing and waited for him to come up. Seconds we waited. Still he did not show up. A full minute we waited although it seemed much longer to me. I caught myself holding my breath as if I were the one under water.

"I suppose we might as well go on," said Drummond.

"The lucky boy," said Macey cheerfully.

It gave me a strangely helpless and desperate feeling, waiting breathlessly while one of our party struggled with unknown terrors in the unknown depths.

"I'm going after him," said Von Holtz, moving toward the end of the raft.

"Not a man moves," shouted Drummond. "One man lost is enough." He drew his gun.

There was a shout two hundred feet behind us. Hanson had bobbed up, his face red. He was puffing and swimming toward us. We operated the sweeps and drew toward him. We were close together when we all yelled at once. Hanson saw it too. On each side of his feet rose an ugly jaw. Hanson drew up his feet and curled into a ball just as rows of gleaming teeth snapped together. The ugly head rose into the air and then arched into the water. A long slimy body followed, the entire length

arching out of the water like a monster eel being dragged over a timber. Drummond had retrieved Hanson's sweep and now he reached far out. Hanson seized the end and we hastily dragged him aboard.

I think that we on board were more shaken than Hanson. He grinned rather sheepishly. Macey, supremely happy in his heaven of dope passed through everything without a ruffle.

"You deprived that cute thing of a tasty meal, Hanson," he said.

"Oh, I don't mind," Hanson grinned. "He'll have to find something else. It was the water that got my goat."

"What was the idea of staying under so long?" asked Macey. "We were just ready to leave you."

"That canal is alive with currents. It felt as if I had traveled for miles under there. I was so turned around I didn't know which end my head was on. Let's stay on the raft from now on."

CHAPTER VI

The Promised Land

● We did not stop to refasten Hanson's sweep. He relieved the rest of us, taking a turn at first one sweep and then another. At last we pulled up on shore at least ten miles downstream from our starting point. We unloaded the raft and Macey pushed it out into the stream. He saluted it.

"The last great masterpiece of O'Malley. Farewell."

We were on the lookout for a camping place as the sun was setting. Single file we threaded our way among the trees, climbing up hill and down. We came upon a shallow gulley in which bubbled a tiny spring. Fortunately for us, the country abounded in springs.

"We might as well camp here," said Drummond.

Von Holtz smelled of the water as he always did before drinking it. He shook his head. He touched his tongue to the water and spat it out.

"No," he said, "we shouldn't drink this. It smells like something in the laboratory but I can't think what it is. And it tastes bad."

We continued our march until we came upon a spring which Von Holtz pronounced fit to drink. Our supper that night consisted mainly of fruit. Only three tins of our original store were left and we finished them. The next morning, after a breakfast of nothing but fruit, we plunged again into the jungle. Toward evening the trees became smaller in size and noticeably stunted. The foliage was thinner and the sunshine that came through stimulated the growth of brush. Traveling became more and more difficult.

The next day real difficulty faced us. As we progressed the scattered trees became stunted and dwarfed. Even the underbrush became more wiry and thin-stemmed. And along with the disappearing forest went the fruit that we had been living upon. Many of the bushes were loaded with berries but we dared not eat them. Again it was Von Holtz who came to our rescue. He indicated a stalk which looked like field corn except that the stalk and leaves were of a brilliant scarlet. It was topped out with a tassel of bright lavender berries. I recalled that we had passed several of the plants on our way.

"These berries are very good to eat," said Von Holtz.

He stripped the berries from the top and passed them around, eating some himself. We found them sweet and juicy and nutritious. I wondered how he knew that they were edible, but I knew better than to ask him. Since the night our rocket was stolen and he had defended me I had felt drawn toward him. I had tried to make conversation with him, but he seemed to have something on his mind. He was a man of few words.

These scarlet plants, however, were scarce. We spread out over a wide front so as to find as many as possible. Each find was a signal for us to cluster about the finder and divide the spoils. As we progressed another plant intrigued us. It was a dwarf shrub on which grew a seed pod similar to that of the bean. We longed for something to cook but were afraid to try them. We discussed the possibilities, however, and were tempted to try them.

We camped early that night around a little puddle of water that oozed from the ground. Springs were becoming few and far between. This one was so small that we were forced to dig a little sump in which to catch the water. After drinking we sat around the fire, a silent, dejected group. Even Macey was silent for his supply of dope had run out and there was none growing on the fringe of the jungle. Von Holtz wandered off alone and the rest of us curled up in our blankets before the fire. It was our first night without supper.

We were half asleep when Von Holtz staggered into camp. He collapsed before the fire. We leaped up and surrounded him. Perspiration stood out on his forehead. His face was tinged with a green cast. In his hand he held some of the bean-shaped pods.

"Poisonous," he gasped. He tried to say more but he curled up with pain and muscular cramps. "My—partner —tell him—." We listened for his gasping words but no more came. A green foam gathered in his mouth and flecked his lips. His eyes rolled back in his head. His body quivered as it curled up tighter with the cramps. Perspiration oozed from his face and dripped to the ground. The muscles of his neck and jaws stood out like whipcords. A convulsive shudder trembled his body and he lay still. Jones examined him.

"Dead."

● We tried to straighten out the body but the queer poison had drawn up the muscles and now even in death they were convulsed and rigid as steel. We heaped rocks on him as he was. I had been carrying a bottle of quinine capsules which we seemed not to need. I emptied the capsules out into my shirt pocket and corked a little note telling about Von Holtz into the bottle. I put this among the stones of the grave and then curled up in my blankets.

I lay for a long time thinking about Von Holtz. Men like this should glorify the pages of history. Men like this, who die quietly that others might live. He probably saved all of our lives, as I learned next day. But there would be no room for him in history. A resentment welled up within me and I cursed bitterly. Even now as I write this I mutter things that are not fit for print.

No, history must drip with the blood spattered by military butchers. It must reek with the smoke of burning cities and be made glorious with the flames of insane destruction. How much nobler a Napoleon, laying waste to the countryside with fire and disease and death than

one of these humble scientists laboring unknown and unrewarded to make the world a more interesting, safer and healthier place in which to live. No, there must be no room for Von Holtz in history when our expedition is mentioned. His grave in the avenue of graves must not be marked.

I was hungry and bitter but I fell asleep.

Next morning we filled our two canteens and resumed our march without breakfast. The pangs of hunger gnawed deeper as the forenoon advanced. Sometimes when one of us found a scarlet stalk he was tempted to say nothing and reserve its berries for himself. Perhaps some of them did. I have a suspicion that that is why Macey did not report a single find.

We eyed the green pods, which were plentiful, with hungry looks of horror. Had not Von Holtz warned us, I am sure that we would have stopped and cooked a huge pot of them. I shuddered when I imagined what would have happened. Famished as we were, we would all have eaten hungrily, without thought of consequences. There would have been no one to make the graves.

We struggled through the day, sweating and cursing. Macey, now that he had no dope, developed a nasty temper. He had lived nonchalantly on top of the world and now resented his dethronement. Scraggly brush tore our clothing. Our shirts were nothing but ribbons. Our boots were wearing out. As we progressed we were cheered somewhat by the fact that the scarlet stalks became a little more plentiful. But water was becoming scarce. We kept the canteens filled. At noon we filled them for the last time. In the afternoon we found but one spring. We dared not drink its water for the ground along the edges was crusted with a pale blue crystalline deposit.

We struggled along until dusk and started a camp fire without thought of looking for water. There was none to look for. We did not taste what was in the canteens. We rolled into our blankets too hungry and tired to care.

I was awakened by a commotion during the night and looked up in time to see Drummond knock Macey flat. Macey lay on the ground moaning. Drummond ordered him to bed and emphasized his order with a kick. "Steal water, will you. Next time you try that, Macey, I'll kill you."

The next day we struggled on again under the blazing sun. Drummond doled the water out to us but the canteens were small. By mid-afternoon one of them was empty and he threw it into the brush. We found a few of the red stalks with lavender berries but not enough to satisfy our hunger. That night we went to bed both hungry and thirsty. The next day was worse. Our remaining canteen was empty by noon. The brush had given way to a few scattered twigs that struggled between the baked reddish-brown soil and the scorching sun. There were no more of the red stalks. We were too miserable to curse.

We plodded through the afternoon. The sun glared down upon us from a dusty sky. The red soil was baked and cracked. It burned our feet. Our lips dried and cracked and our tongues became so swollen that there was scarcely room for them in our mouths. I spied a pool of sparkling water and I staggered to it with a glad gurgle. I fell down at the water's edge to bury my head in its cool depths. The crystal water faded and there was nothing but red heat. I lay choked with disappointment.

Slowly I dragged myself to my feet and plodded on. We went on and on. I did not see the country. I was living in another world. I was back on the earth most of the time. Sometimes I wandered off in queer directions and Drummond woke me up with harsh commands. We plodded on.

We camped that night without a fire. There was nothing to burn. There was nothing to burn it for. It became cold and we shivered. My arms and legs cramped with the cold. I did not sleep. I became unconscious. In the morning we climbed out of the cold into the heat of the day. We welcome the sun only to curse it after an hour. It burned down through my scalp and set my brain on fire. I lived in a pink haze. I stumbled and fell. I did not bother to get up. There was nothing to get up for.

● I felt a sharp pain in my ribs that was different from the other pains. I rolled over on my back and focused my burning eyes upward. Drummond was standing over me. His cheeks were hollow. His lips were dark and cracked. But his eyes burned with strange fire.

"Get up," I heard him croak. He kicked me again. The voice and pain seemed far away but they commanded. I drew myself to my feet and staggered on. I heard him curse and kick others. I began to hate him. I blamed him for all our discomforts. I blamed him and cursed him for not letting me lie in peace. I cursed him because he seemed to think that he was going somewhere.

I think that I walked with my eyes closed. Sometimes I felt cool and happy. Sometimes I felt as if I were burning in hell.

I stumbled against something. It felt like brush. I leaned against it and struggled on. It gave before me but walking was almost impossible. Dimly I heard Drummond's voice. "Halt, Food." I tried to focus my eyes upon my surroundings. They burned from the glaring sun. Slowly I made out my surroundings. Dimly I could see red stalks. They were larger than any we had seen. I felt along one of the stalks. I found the tassel of lavender berries at the top. I sank to the ground, dragging the stalk with me. I ate one of the berries. As the rich juice trickled down my throat it seemed to go directly into my blood. I could feel new strength coursing through my veins. I ate more. My body came back to me. New aches and pains came back with it.

I could see better now. The berries were three times as large as any we had found in the outskirts of the jungle. And they were more luscious and juicy and sweet. I stripped the tassel and lay for a time with my eyes closed while the waves of strength revived me. My side was bruised and sore where Drummond had kicked me.

I was glad that he had kicked me. I felt a wave of affection for him for having forced us onward to this feast. I wondered where we were. Curiosity overcame my languid feeling and I opened my eyes. I stared about. We were in a jungle of nothing but red stalks. They grew in rows. Slowly it dawned upon me that it was a field and that they had been planted in rows. I was lying in a ditch between two of the rows. The bottom was caked and cracked into mosaic designs. I began to realize that

water had flowed recently in that ditch. It was an irrigating ditch.

I dragged another stalk down and ate some more berries. The sun was in the west and it was not quite so hot. I closed my eyes in weary contentment. I must have slept for when I opened my eyes again it was almost dark. I thought of the others. I staggered to my feet and searched about the field. I found them scattered about, sleeping in grotesque positions. I found Drummond sitting nearby. He looked at me and smiled as much as his cracked lips would permit.

"How do you feel, Nordstrom? Sorry I had to kick you but there was nothing else to do."

"Thanks for kicking me," I said. "If you hadn't I'd still have been out there. But how did you keep on, and how did you hold to your course?"

"I've been trying to figure that out. I couldn't keep Matheson out of my mind. When things got dim I'd recall how he shot himself so that we could go on and that would bring me back. Then I would feel as if nothing could stop us and I would be all right for a time until things grew dim again."

"And O'Malley and Von Holtz," I added.

"We're lucky we didn't lose more," said Drummond.

"We may as well camp here and rest. Help me arouse the others."

The next morning we felt revived. Our lips had even begun to heal. It was easy walking between the rows of stalks. When we became thirsty we stopped and ate berries. Toward noon, however, they began to sicken us and we preferred to go on without moisture. But we did not suffer so much for there was moisture on every hand should we wish it.

The field lay on a gentle slope. From what we could see, we were approaching the crest of a rise in the ground. We were near the top when we stopped to rest at noon. We were sitting and lying about discussing our next move when Jones shouted and pointed toward the north. Between the rows we had glimpses of one of the Martian ships flashing through the sky. It seemed to have risen from just beyond the knoll and sailed higher as it winged toward the west. In a few seconds it dwindled to a speck and then faded high in the western sky.

"Come on," said Drummond. "Let's see where that ship came from."

A half hour later we reached the crest of the slope and came upon a ditch of water flowing rapidly along the ridge toward the east. We forgot about Martians and the ships as we stripped and plunged into the cool water. Although we dared not drink it, we lolled about, absorbing the moisture through our skins. Our sunken cheeks seemed to fill out and our eyes became less dull. After an hour of this luxury we bundled our clothes and luggage and carried them across and dressed.

● The top of the ridge was almost flat but in a short distance it sloped away toward the north. Here we stopped in amazement. At the base of the gentle slope two or three miles away the field ended and a great city began. The edge of a jungle bounded it to the west and stretched toward the east as far as we could see. It appeared to be about a mile wide. We couldn't have missed it in our wandering for it formed a wall across our path.

The buildings were made of what appeared to be stone. Here and there gilded spires that looked like onions strung on slender needles gleamed with strange lonesomeness in the slanting rays of the sun. Breaking the rows of houses were great patches that looked like bottomless holes in the ground. As we now know, these were slabs of material which completely absorbed and stored the heat and light from the sun and furnished power to replace the obsolete power plants along the canals.

In silence we contemplated the scene before us. It was with mingled awe and fear that I looked out over the golden splendor of the vast metropolis. And little wonder, for we were gazing upon the capitol city which the Martians called *Theemell*, the beautiful city which was later almost completely destroyed by earth invaders. We were gazing out upon Matheson's promised land which lay west of the earth, to which the crest wave of earth civilization was soon to leap.

"Look!" cried Hanson suddenly. "Our rocket!"

We strained our eyes in the direction he pointed. Now we could see it! It lay on the north edge of the city, its polished shape gleaming against the red earth. We saw tiny shapes moving about its silvery hull. We withdrew from sight among the stalks of the field and sat down for a council of war.

"It would be ridiculous to attack the city," said Drummond. "We have no idea of the nature of our enemies. Are there any suggestions?"

There were none.

"My idea is to wait until dark and then try to slip through the city to our ship."

"How about going around the end of the city next to the jungle?" asked Martin.

"I thought of that too but it would take two days and there is no food or water out there. Two more days without food or water does not appeal to me. And another thing, there is no cover out there, especially on the north side of the city. They'd see us immediately. No, there seems to be no alternative except to steal through after dark."

CHAPTER VII

The Martians

● While we waited for darkness we took our automatics and rifles apart and cleaned them with strips torn from our shirts. We even cleaned and polished the cartridges struck in the loops in our belts, to make sure that there should be no trouble with jammed guns.

As dusk fell upon the city it began to glow with a halo of misty radiance. It was the energy of stored up sunlight being released. Small lights twinkled in the nebulous cloud of light that enfolded the city. Hour after hour we waited but there was no change.

"We might as well go now," said Drummond. "No use to wait longer. Remember now, no noise. And keep close together."

As we approached the city the light grew brighter until, when we were still half a mile away, we could have read a newspaper easily. After we left the field there was no shelter so we moved boldly toward the city. We stopped at the edge and gazed about us in wonder. The buildings were grouped in blocks but instead of being square the blocks were round. The streets were wide.

I thought of cookies cut from dough with the built-up portion of the city being the cookies and the dough that was left being the streets. The streets were paved with a rubbery substance on which our boots made not the slightest sound. The pavement was perfectly flat. Evidently they had no rainfall to make the crowning of their streets for drainage necessary. There were no sidewalks.

As we advanced between the little buildings of massive stone and saw no movement we breathed easier. We had gone about half the distance without seeing a sign of life when we heard a sound from one of the buildings to our left. We increased our pace. There was no dark place in which to hide. A window ahead of us opened and something popped out and fell to the pavement where it rolled a short distance and stopped.

We circled the object warily, fearing that it might be a bomb. Yet it did not explode.

I looked at the object carefully. It was green, as I could plainly see in the soft glow that lighted the street. It was round and about the size of a baseball. From the way it landed and rolled I imagined that it was very light —probably hollow. There was something fascinating about it. Now I could smell it. It permeated the air with an exotic odor that seemed to combine everything that we of earth long for.

Had I been an animal I am sure that I should have tried to eat it. As it was, I longed to possess it. It filled me with an unholy longing to possess it and cherish it and keep it with me always. It drew me toward it as if some strange force were taking control of my body. Step by step it drew me toward it. I heard Drummond's sharp voice but it was dim and far away. He slapped me a resounding blow on the cheek and I dragged my eyes away from that object. Now that I looked away from it a sense of narrowly averted disaster chilled my spine. I thought of the thing as a sinister reptile that had ensnared my will and had been drawing me into bondage.

We broke into a run now, knowing that we had been discovered. We had gone only a block when suddenly large numbers of the balls were hurled into the street. Drummond tried to lead us down a side street and shouted "This way!" but before we could turn we were under the awful power of the things. Yet now that we were under their influence we did not realize their deadliness.

Slowly and relentlessly we were drawn toward the innocent-looking green ball. As we came closer that exotic odor overpowered us and impelled us irresistably. Our minds and wills ceased to function and the motions of our bodies passed from our control. As we drew nearer a darkness began to enfold us. We fought against it but it was relentless. We could feel our legs carrying us forward yet could not stop them.

We did not try to stop them. But we fought the darkness for we did not wish to miss any of that enticing odor. We forgot our surroundings, our rocket; everything except these eggs and their hypnotic odor. The darkness became blacker. I recall dimly that now, under its strange influence, I felt no fear. Only a gradual enfoldment of darkness against which I no longer struggled.

As if far away, I was dimly conscious of movement of my legs carrying me away. It was as if I were sitting on a horse in total darkness and half asleep while the horse carried me along, I cared not where. I'll never forget the feeling.

● When we came to, it was with a suddenness that left us staggered and bewildered. We were confused as if we had been dead and had suddenly come to life in a strange place. We gathered our scattered wits and began to notice our surroundings. We were in a long hall. Massive columns supported the vaulted ceiling. It reminded me of the power-house down at the falls of the canal, except that the material used in this hall was a beautifully polished cream marble instead of smoothly hewn brownstone. And now for the first time we actually saw the Martians.

We had speculated as to what they looked like but they were beyond our wildest guesses. The first thing we noticed was naturally the most conspicuous and startling. Protruding from the top of each egg-shaped body was a short spike on which perched a brilliant compound eye. Through some queer organic twist the Martian was able to see in every direction at once instead of seeing only one small area at a time as we do.

Further, he did not move his eye as ours shift from point to point. The spherical eye had an almost mechanical fixity that was confusing and hypnotic. Their torsos were egg-shaped which is due, as we know, to the fact that their spine was located along the axis of their bodies and the internal organs suspended about this central spine like a bunch of grapes. These, surrounded by a protective shell of tough gristle and skin, gave them a circular cross section. They had no heads. Their mouths opened at the upper ends of their bodies.

Each had four pairs of arms terminating in hands consisting of a thumb and two fingers. I thought of the six-legged, three-toed animals we had seen in the jungle. Their legs were thin and short. They wore tight fitting suits of mesh that had a metallic sheen.

Evidently we were facing a council of some sort. One of the strange little men (they were only four feet tall) advanced and held a sheet of that thin green metal out to us. Drummond took it and after glancing at it passed it to me. More code. I translated it on a blank page from Matheson's notebook and transposed it.

"Men of Earth," it read, "why do you come to our city? Since the jungle did not get you it will be necessary for us to kill you. You refused to obey our orders. Are you mad?" It was signed with that strange scrawl under which was added, "Earth Languages Expert." Drummond read it and frowned.

"Tell them that we have changed our minds. That we are going back and will never again visit Mars," he ordered. "That no one shall ever again come to Mars from the earth."

"But," I objected, "we can't very well promise that when we know that others will come soon."

"What else can we tell them under the circumstances?" snapped Drummond. "We're going regardless of what we have to tell them. Tell them what I said and don't argue. We'll see how they take it."

I wrote the dots and dashes on the page of paper and added, "bring your radio for quicker communication."

My note was handed to one of the council who read it and communicated it in a sing-song voice to the others. There was some discussion and then one of them touched a button. He spoke a few more words and presently a little cabinet on wheels was pushed into the hall by two of the rotund little Martians. The one who had translated

my message made some adjustments and then touched a knob on the cabinet. A disc of metal on the side vibrated in a high pitched squeal. He motioned to me to try it.

Gingerly I touched the knob, not knowing whether or not it might jolt me, for it was of metal and did not move. Evidently the contact of the finger actuated some sort of circuit. But there was no shock. Only the squeal of the diaphragm. I tapped out "very good." He echoed my verdict and thus began one of the strangest conversations on record—two races who could not understand each other's spoken language yet meeting on the common ground of dots and dashes.

After some sing-song discussion the Martian tapped out, "The men of earth defied us and our warning yet now they decide to return to earth and never return. We do not understand this. When a thing is done it is done."

Drummond, who read this over my shoulder, thought a moment and then said, "Tell them that the man who ordered us to defy them is now dead. That we who are here wished to heed the Martians, but that the leader who is now dead, refused."

As I tapped this out I pondered the strange words of the Martians. It was the first intimation I had of one of their mental peculiarities, yet the full significance of it and the effect of Drummond's lies was left for history to reveal.

After some discussion came the answer in the form of a question. "Then there is one among you who is a greater will and mind than the rest and who answers for all?"

"Yes."

"And who is the greater mind, now that the other is dead?"

● I indicated Drummond. They pointed at him and sang among themselves. Then came the next question.

"Now that he is the greater mind, the rest of you are really not the same body that you were before?"

It was another peculiar twist of their logic. Drummond said, "No, we are a different body now that our former great mind is dead," and I tapped it out.

"Then if this new body agrees to return to earth and says that no one shall ever again come from Earth to Mars, it will be so 'and has nothing to do with the first refusal under the other great mind who is now dead?"

"Yes."

I recall that I hated to tap out deliberate lies but there was nothing else to do, for Drummond dictated and he would be stopped by nothing. There was considerable palaver over this answer. Finally came the answer to our first question.

"Then you may return if the great mind promises that no one shall ever again come from Earth to Mars."

"He promises," Drummond dictated.

"Then you may go in three days. Our engineers and great minds are examining your strange ship. Shall we keep you in captivity or do you wish to roam about the city?"

To us that last question was ridiculous, although as we know now, it was perfectly logical to the Martian. It was akin to our asking an honorable prisoner who is not a criminal whether or not he wished to be paroled on his honor. It might happen with us rarely in the case of officers who are prisoners of war or in rare cases where the integrity of the prisoner is beyond question. But among the Martians it was not a matter of courtesy. It was a routine proposition placed before all their prisoners, and another of their characteristics due to their peculiar mental habits and evolution.

"We wish to roam the city instead of being held captive," Drummond dictated.

"Then the great mind signifies that he and his council promise to do as the Martians do and will not try to exhibit any of the brutal methods of Earth."

"He promises and understands."

That broke up the meeting. Nothing more was said and we simply walked out of the hall and into the street. There were many Martians about, who seemed not to even see us. It was because of those confounded eyes of theirs. They looked in all directions without seeming to look anywhere.

"Suppose that they change their minds before the three days are up?" said Jones. "It sounds queer to me."

"The whole negotiation sounds queer to me," said Drummond. "It was all too easy to be true. Recall what they said about killing us. I've been thinking that they are afraid of what they call our brutal methods and intend to get us from ambush. I've sworn that we're going through and we are.

"Here's my plan: We'll wander over toward our ship and if anyone tries to stop us we shoot our way through. We've no alternative than to get out of here. Matheson died for that purpose and we can do no more."

"I believe that they mean just what they say," said Hanson. "I move that we behave and wait three days."

"You're nothing but a dumb Swede," Macey sneered. "They're up to some trick. There's nothing to do but beat them to it."

"That's enough from both of you," snapped Drummond. "No quarreling. Macey, you'll have to keep that nasty tongue quiet."

As we wandered closer and closer to our ship, I wondered about these people with the glassy eyes and queer mentalities. There was something significant about their answers and questions that haunted me. Added to this was the fact that none of our possessions had been disturbed. Our rifles were in their holsters just as they had been when we entered the city. Apparently we had not been searched or even touched during our period of semi-consciousness.

I began to think that Hanson was right but I said nothing. There was no use trying to argue with Drummond. When he made up his mind he was like an earthquake—he acted regardless of seismographs. I wished that Matheson could have been with us now. His deeper understanding and tempered ardor would have been comforting.

We came to the northern edge of the city. Now that we were beyond the buildings we could see, less than a mile away, the gleaming hull of our rocket. We went back to the streets and wandered casually in the direction of the ship. We pretended nonchalance although I thought it unnecessary and it made me feel rather foolish. When we came to the ship we found great activity. Martians were swarming about, some measuring and others writing on sheets of green metal. Others were examining the rocket tubes. Still others swarmed in and out through the open air-lock.

We stopped to size up the situation. The Martians appeared not to notice us, but that feeling was due to their expressionless all-seeing eyes. Now as I watched them I did not feel guilty of deceit. I suppose that had they had eyes like ours and had focused them upon me I should have squirmed.

● "We'll form a wedge," said Drummond. "I'll take the point. I'll shoot straight ahead; those on the left wing shoot to the front and left while the right wing will shoot front and right. The main thing is to clear a lane to the air-lock."

There were nine of us left. Drummond assigned each of us to his position in the wedge. We rehearsed until we were sure that there would be no confusion when he gave the word. There was something incongruous about rehearsing our battle formation within a stone's throw of the enemy, taking our time as if we were rehearsing for a play on the stage. We went carefully into other details.

As soon as we were within the ship the others were to clear the ship while Jones and I manned the machine gun which was kept strapped in the hull in the engine room beside the inner door of the lock. I was to unstrap the gun while Jones was to get out the ammunition. Together we were to drag the gun into position and keep the lock clear while the others cleared the ship of the enemy. We went over our plans carefully until we were sure that we could go through the routine like clockwork.

We fretted nervously while Drummond studied the position of the rocket where it lay upon the ground. Macey, who was one of our chief rocket and explosive experts, discussed the situation with him and now for the first time we realized the difficulty. The rocket was not designed for taking off from a horizontal position. They discussed the rise in the ground ahead of the ship and the strength of the steering rockets and the possibility of lifting the nose of the ship with the steering rockets. They talked about skidding the ship up the hill and taking off over the crest of the rise.

"Jones and Nordstrom," said Drummond when they were through with technicalities, "as soon as the ship is cleared of the enemy, you are to close the air-locks and then report to me. I'll be in the control room. I'll watch through the ports and do what is necessary with the rockets. As soon as the lock doors are closed everyone is to go to the stern to keep the weight away from the prow. All clear? Are there any more suggestions?"

"What are we going to do if they throw a basketful of those sweet little balls?" asked Jones.

"That is the chance we'll have to take," said Drummond.

We edged closer to the air-lock door until we were as close as we could get without exciting suspicion. There was only half a block to go. Drummond waited. The Martians hurried about busily. It was this waiting that told on my nerves. I had time to wonder what would happen when we charged. They had spoken casually about having to kill us. I recalled that constantly. The longer we waited the longer I had time to think about our plans and the less brilliant the scheme looked to me. I couldn't rid myself of the memory of that haunting, exotic odor and hypnotic fascination surrounding those little balls of green.

In their bustling about the Martians at last left a space comparatively clear before the air-lock. It was the moment Drummond had been waiting for. "Forward!" he shouted, and started ahead at a run. We drew our pistols and fell into place in the wedge just as we had rehearsed. There was no confusion. Something of the spirit of Drummond surged back along the lines. It was that feeling visioned at the death of Matheson. We felt like a relentless machine which nothing could stop.

We covered half the distance without firing a shot. We passed several Martians but paid no attention to them. "Fire!" Drummond yelled as his pistol cracked sharply. We opened fire and swept our path with a hail of vicious lead. Several Martians sagged to the ground and we trampled over them without swerving. We sent volley after volley of hissing lead into their bodies. Some of them ran out of our way. Suddenly one of the little green balls sailed over the heads of the Martians and landed in our path. I felt the strange influence of it.

Whether Drummond felt it or not, he gave no sign. He kicked the thing viciously out of the way and we swept on. As we passed the spot I could smell that haunting odor. The fighting impulse drained from my body and the strange fascination took its place. I heard Drummond's commanding voice order us on. There was something in it that recalled us to the present and we opened fire again, blasting a clearing before the air-lock. When we were close to the door a veritable hail of green balls dropped around us. The fascination was horrible.

Drummond ran around to the rear of the wedge. "Club your rifles!" he yelled. Mechanically we unslung our rifles and mechanically we swung them, knocking the eyes off the Martians who stood between us and the lock. But the green balls were surely overpowering us. Our arms became heavy. Our surroundings were growing dim, as if a half light had settled about us. Faintly we heard Drummond.

"Into the air-lock," he yelled above the uproar and through the settling darkness. "Remember Matheson! I'll kill the first man to let go!"

● The fiery will of the man was amazing. How he could retain his senses in the face of that hypnotic smell is more than I could understand. We swung our clubbed rifles like mechanical furies and surged through the lock into the ship. Now it was the carefully laid plans that saved us. Dimly, as if following hypnotic orders, I unstrapped the machine gun while Jones got out the drums of ammunition. The odor was not so strong within the ship yet strong enough to make us act mechanically.

As in a dream we opened with the chattering gun. It swept a wide clearing before the door but could not reach the Martians close beside the door and those on top of the ship. More balls rained down and the stronger odor assailed us. The drum ran out and I could not reload the weapon. Darkness again crept down upon us. As the darkness thickened I was aware of Jones creeping out of the ship like a sleepwalker. My legs began to raise me from where I crouched behind the gun and I would also have walked out had not Drummond again saved the fight. Dimly I heard the roar of the propeller tubes. The ship skidded some distance from the scene of the fight and again stopped. We were away from that pile of balls and the air cleared and so did my mind. Martians came running toward us from the city, but I could act again.

Quickly I reloaded the gun and swept the space before the door with short bursts, keeping the Martians so far back that they could not throw their missiles close to the

lock. They drew back before the hail of lead but others began to circle the ship. I heard scattered shots within the ship but paid no attention to them. The others dragged several dead Martians to the door and threw them outside. I kept the gun chattering in bursts, keeping the front clear while the other mopped up.

I leaned from the door and looked around. The Martians who were circling the ship were almost within throwing distance. I dared not risk another encounter with those exotic balls, so I slammed the outer door of the lock and screwed it up against its rubber gaskets. Quickly I dragged the gun out of the way and closed the inner door. I ran to the control cabin where Drummond stood waiting.

"Ready!" I yelled. "Lock doors sealed. They got Jones."

"Have to leave him," said Drummond.

He punched a button on the control board. The propeller tubes burst into thunder and the ship began to skid. He touched three more buttons and steering rockets shrieked. The fiercely expanding gases from the steering rockets seemed to cushion the rocket on the ground. It skidded faster and began to float as if cushioned. At the top of the rise in the ground the ship left the planet and swooped skyward in a great arc.

I often wondered what the Martians thought when they saw that roaring demon of flame and smoke slide along the ground and then thunder into the heavens and disappear.

Of our return trip there is nothing to say except that it was worse. We had little confidence in Drummond, but he landed us safely on a mountainside in the interior of California. Because of our hasty departure, we brought back with us five dead and two live Martians.

The rest is history. How the Martians had really been sincere in their promises and had had no other thought than that we too were sincere. They had never thought or heard of such a thing as deception. But the lies and treachery of Drummond taught them an entirely new thing—deceit. After our foul play in fighting them, they recovered from their surprise and found that a new element had entered their logic and reasoning.

They studied deceit as a science. When Drummond led his second historic expedition, easily financed by the tales of wealth on Mars, the Martians were ready. When the twenty rockets landed, the Martians showered the three hundred men with balls thrown from one of their silent green ships. They succumbed to the odor, but instead of passing into darkness, each man of the expedition was deceived with the hallucination that all the rest of his fellows were enemies. They killed each other to the last man.

How Macey, financed by lawless elements, somehow got in with the Martians and became one of them, teaching them how to fight Earthmen, at the same time piling up a fortune from the black drug that scattered drug-frenzied moral wreckage through the pages of history.

How at last a scientist discovered that the green balls were made of an extract of that black seed pod and were anaesthetic and narcotic in nature. It dulled the will and mind of the victim and he passed easily into the hypnotic state under the powerful wills and minds of the Martians. The scientists devised a remedy, and the conquest and downfall of Mars passed into history.

Now as I see the results I recall the words of Matheson. "Progress comes of struggle." How true they were. Those who braved the horrors of the Martian level in that respect and then advanced beyond. In their struggles they seemed to absorb the Martian mind and will power even as they conquered them. It always happens when the crest of civilization advances. Now these conquerors are the giants who rule the two planets, while a few, like Macey, are the master criminals of the new era.

And we who are left behind (I had not the courage to return). Ah, we are like white ants crawling over what is left, slowly trying to digest the mental droppings of those who have gone beyond to greater heights. We gaze in envy at those who dared to carry the beacon of Matheson to victory and to their reward, yet we curse them. For we have not the courage to go nor the grace to accept the inevitable in the relentless onward surge of the crest wave of civilization as it sweeps ever westward.

THE END

Are There Other Inhabited Worlds?

● INTERPLANETARY travel stories derive the greater portion of their interest from the idea that elsewhere in the universe there are intelligent beings with whom we can communicate. Whether they will be friendly, or hostile; whether they are human in form and mentality, or like we have imagined in our wildest dreams; whether they are inferior or superior to Earthmen—have been problems to exercise every writer and every reader of interplanetary science and science fiction.

In addition to this, we wonder how many of the stars we see have inhabited planets like our Earth. The latest scientific theories concerning the formation of the Solar System are discussed in "The Birth of Our World," by Dr. Donald H. Menzel; who points out that many astronomers doubt the existence of planets outside our own system, and suggests an interesting alternative, found in the theories of Einstein, which would permit the existence of many other abodes of life. This, together with articles on scientific topics, such as the coming total solar eclipse, the constitution of the Ocean, the living conditions of Twenty-First Century humanity, etc., is found in the September issue of

EVERYDAY SCIENCE AND MECHANICS

NOW ON THE NEWSSTANDS

(*Illustration by Paul*)

It was the fog-balls that completed the demoralization. Driven by the winds, they carried within themselves lethal death.

AFTER ARMAGEDDON

By FRANCIS FLAGG

● Many of our writers, notably Carl W. Spohr in his "The Final War," have pictured the horror of future scientific warfare; and perhaps the ultimate collapse of our civilization.

Curiosity naturally asks, "what would happen to the survivors were our present civilization destroyed and man were thrown back upon the none-too-gentle arms of nature for survival?" Who would then be the leaders in the race? How would they meet the onslaughts of the elements and of wild beasts?

These fascinating and adventurous thoughts are dealt with by Mr. Flagg in this short but entertaining story.

● I try to tell them of the days before, of the days when what we called civilization covered the face of the earth, and even reached hands of trade and greed into the savage spots of jungle and desert. But to them it is all unreal, a wonderful tale of times when gods walked the earth.

But you, Bilembo, whom I have reared in my extreme old age, to whom I have showed the hidden things which the ignorant ones can but worship—you will believe somewhat.

The books I have taught you to read bear witness to the story I tell.

Soon I die. But through you the record of what has been shall live on; you shall be the custodian of the hidden things; and you shall appoint another to take your place before you pass on—your son if you have one— and he in turn shall do likewise. To what purpose? I know not; save that when in time to come man again evolves socially to civilized stature, he shall be warned to shun the blind greed and stupid mistakes of those who preceded him on that path.

Once, Bilembo, a great city stood where our log huts and skin tents now stand. Nothing of that city remains. But further south you may find crumbling ruins still persisting, ruins that the fog-balls have missed or touched but lightly. This great city was called Los Angeles. You have seen its name on the maps I have shown you, and in the books; but the maps and books can give you no conception of its size and wonder.

For fifty miles (what are now called "walks", Bilembo) it stretched from the hills to the sea, and almost as many down the coast. Formerly there had been many cities—Pasadena, Long Beach, Hollywood; but in the year 1960 they were all engulfed by Los Angeles, though their names persisted unchanged as designations of suburbs.

And on the eastern seaboard lay another mighty city, New York, extending for miles.

See, I show it to you on this map.

And here by those great lakes still a third huge metropolis, Chicago—gone; all gone!

I weep. I am an old man; and despite the many years I have dwelt thus, alien to the savagery into which my race has sunk. But see; I have conquered my tears. Yes, I know that only babes weep, and old women. Forgive me, Bilembo, I shall not do it again.

The skyscrapers went up towards the clouds a thousand feet, and airships darkened the sky and men walked on air. Those pictures the people persist in worshipping as gods coming down from heaven, they are nothing more nor less than the pictures of people of my day striding through the atmosphere as easily as you pace the trail to the watercourse.

And more than that: there were rocket ships which hurtled from coast to coast, rising at first thirty, fifty miles above earth (yes, thirty long walks, Bilembo), so that the friction of the air would not impede nor burn them up.

No, I can't explain that to you—we laymen never quite understood the marvelousness of it ourselves. There were many things in the latter days of our civilization which the average citizen never fully understood.

I was walking peacefully from my office in the *Times* building at the three thousand foot level, one of the heights devoted exclusively to air-foot traffic, when it occurred to me to press the news-broadcasting button on my power rod and pick up the latest dispatches. There were, I remember, some items about food riots in Boston, hostile demonstrations against the American consul in Cuba, and then suddenly this:

"International Peace Conference in Paris breaks down. Attitude of England threatens ultimate success of world outlawry of war."

I listened to this news, like millions of others, without in the least realizing its seriousness.

At home—I owned an *Ulriray* cottage on the slopes of Mount Lowe—my wife informed me that Stanley Brownson wanted me at once on the photo-phone. Still carelessly walking on air (most well-to-do homes in those days were carpeted by a pneumatic device), I went to the aluminum booth, twisted the necessary dials, and saw the long, serious face of Brownson form in the receiving mirror.

Brownson was more important in the field of science

than I was in the realm of super-business, though at that I was prominent enough. I was secretary to Justus Ebert, a money king, Bilembo, and head of the radio-transportation and photophone trust, with subsidiary holdings in rocket, food and oil companies. My salary was a hundred thousand a year. Brownson was the only intimate friend I possessed.

● "John," he asked quickly, "have you heard of the breakdown of the peace conference in Paris?"

"Yes," I said, "it was being broadcasted among the late dispatches.

He shook his head gravely.

"I'm afraid," he said, "that this means war."

I jeered at him for being an alarmist. It was the thing to do those days, ridicule any suggestion of world disaster.

"Not at all," I said confidently. "We've got Grimes over there, and Brewster; they'll keep things peaceful."

He said warningly: "You're putting too much trust in Grimes and Brewster—all of us are. Isn't it true they own the *alamite* process, with interests in . . ."

"Good God, Stanley!" I said, "you're not suggesting they'd deliberately . . ."

"Why not? Wasn't Grimes hand-in-glove with Smiley of England in that poison-smoke affair that put France under in '45?"

"But that was different," I protested. "It was they or us."

"And won't it be they or us this time too?"

Before I could answer, my wife threw open the booth door and cried out agitatedly: "John! come quickly; something queer is happening."

With a muttered apology to Brownson, and a promise to be back in a minute—a promise destined never to be kept—I hurried from the booth and joined her on the large observation porch. Several of the servants were standing there with her, an unprecedented thing. But though I looked at them severely they did not retire.

Only Williams the butler preserved some sense of decorum by hovering in the background. A big, burly man was Williams with a beefy English face and the imposing manner of an archbishop or a duke. For ten years he had been in my employ—ever since my marriage at the age of thirty—and looking at him that evening standing impassively and respectfully to the rear, I never for a moment suspected our altered relations of the future. My wife clung to my arm.

"Look!" she said, "what does that mean?"

It was still daylight, about six o'clock of a July evening. From Pasadena at the foot of the mountain the great city swept away on every side. My wife had already turned the mechanism which focussed the glass, housing the observation porch, so that the central part of the city, dominated by the magnificent and but newly constructed billion-dollar aerdrome and aerial-landing field, was plainly visible.

Even the coast environs stood out in stark relief, for we were looking down on the lower parts of the city from an elevation of thirty-five hundred feet, an elevation which dwarfed the thousand-foot buildings.

At first I saw nothing amiss, and then—with a leap of the heart—realized what she meant. Though the sun was but sinking in the west, though the sky was crimson with its departing glory, an ominous darkness lowered there, a darkness so strange and weird and rapidly deepening, so alien to cloud or storm, that I could only stare in astonishment and fear.

"I noticed it," said my wife, "just after something seemed to burst. At first it appeared no bigger than the palm of my hand; but look how it is increasing."

And not only was it increasing, but advancing.

One of the kitchen girls—a forlorn little thing in a mesh-metal apron—began to sob softly.. (Everybody, it seemed, save myself in the sound-proof photo-phone booth, had heard the dull noise of the explosion accompanying the initial phenomenon). "Oh," she whispered, "I'm afraid, afraid."

At that moment the automatic news-dispenser in the large hall beyond the porch coughed raucously, while a red light flashed high up in its dome. Ordinarily one turned the contrivance on or off at will, but the emergency shift was a matter of civic and national control, and news coming in this manner was sent out as a measure of public safety and warning. Only under the gravest circumstances was the emergency broadcaster ever used.

"Attention!" screamed the loud-speaker, "attention! All citizens, attention! Washington, D.C. talking! War! war! America is at war! Paris is burning; alamite aerial squadrons blow up London; Berlin in ruins. Everywhere our forces have been successful. Super-mustard gas blankets English Isles. Rumored French Chemical Corps fired automatic controlled rocket ships at the United States nearly six hours before our forces attacked and wiped them out. How many ships is unknown. Shells filled with deadly mystery gas explosive. Attention! Attention! Los Angeles, Chicago, New York, Boston: citizens will be in readiness to take to under-city subway shelters in case of necessity. Time of arrival of ships; Los Angeles six, Denver . . ."

CHAPTER II

The Catastrophe

● I heard no more. The servants were now screaming, rushing about. Only Williams stood stolidly to attention. I looked fearfully westward and at what I saw recoiled in horror. For the weird darkness was slowly but surely spreading, advancing, and as it did so I saw great buildings disintegrate, collapse. Oh, it was horrible, horrible!

The darkness was something into which one could see with startling clarity. Only its base churned and shot forth streamers of intense light, eating, consuming. Suddenly the house rocked to the quake of a dull explosion, another and another, spaced monotonously at minute intervals; and in between the explosions came to our ears, even on that heavily glass-encompassed porch, such a concentrated cry of agony and fear from the doomed city that it beggars description. Out of the massive aerdrome and off the aerial field, untouched as yet by the creeping darkness, airships rose like flocks of startled birds. Tiny figures could be discerned running this way and that on aerial shoes.

"My God!" I whispered, half- stunned, "A French rocket ship has dropped its deadly shells on Los Angeles! Williams, Williams . . ."

"Steady, sir," said Williams. Even then I wondered at his colossal calmness.

"What are we to do?" I gasped.

"Take to the air, sir. The subway shelters are useless, being blown up."

He was right, of course. Between us we supported my half-swooning wife to the roof. Again I looked westward. The great white bulk of the aerdrome was gone, blotted out, and the immense mooring tower of the auditorium tottered and crashed even as I gazed. Down from the sky, like birds stricken in flight, aerial walkers were falling in thousands. With a thrill of unutterable horror I realized that the power stations from which they picked up the energy to compress air on which to walk were being destroyed.

I stared, appalled. Under the sable folds of weird darkness half Los Angeles was a swirling mist. Out of this mist, at every sullen detonation, lurid flames leapt heavenward and then sank back into smoldering quiescence. Is it any wonder that I stood there like a man in a nightmare. But a half hour ago everything had been safe, normal, and now, now . . .

The pilot of my twelve-passenger Damler stepped forward and saluted briefly. "The ship is ready, sir."

Williams was herding the half dozen servants aboard. The house shook as if a quake were continuously rocking it, and a low subterannean rumble began to intermingle with the more even series of explosions.

"Let us be off!" I cried frantically.

Latham pushed the control-stick over, twirled a dial, and lifted by her *mills* the Damler rose. At an elevation of six thousand feet she straightened out and, with nose pointed east, sped into the coming dusk.

Never shall I forget that panic-stricken flight. Overhead the brighter stars began to show. Below, the lofty ridges of the Sierras slid by. In the folds of deep mountain valleys it was already night and the lights of small towns and villages glimmered like fireflies. With trembling fingers I manipulated the receiving-set the Damler carried. A voice spoke—a human voice—not the mechanically prepared voice of the machine—caught in the midst of broadcasting a message.

". . . fails to answer. Last word through said city was being destroyed. Government aerial beacon depot number twenty-two reports explosion twenty miles south of it in vicinity of Denver. U. S. rocket ships expect to meet enemy rockets on fifty-mile altitude level and shoot them down. All citizens requested to remain calm. The president is at his desk. He . . ."

The voice ceased abruptly. From the receiving-set came a medley of sounds, a faint roar like the shrieking of many people. Then suddenly the noise was cut off as if by the closing of a door and the voice began to speak again, no longer in cool, collected tones, but tensely, fraught with excitement.

"Washington is being attacked. A bomb has burst in the suburbs."

The distant roar rose again.

"What's that?" came the voice of the broadcaster, as if he addressed a messenger newly arrived. "The Capitol? My God! . . ." His exclamation trailed away. Then dominating the mounting roar of shrieking people was heard a dull, ominous noise, and another, and another. Through it the voice of the broadcaster shouted hoarsely:

"Washington is burning, blowing up! New York . . ."

But what he meant to say about New York was never uttered. For out of the loudspeaker came a rending and a tearing as if all the static of the universe, mingled with shrieks, groans, went up, up, in one terrible crescendo of sound—and then ceased.

We stared at one another with ghastly faces. Even Williams' iron control could not prevent his lips from twitching. The National Broadcasting Station had been wiped out!

Francis Flagg

● Ah, Bilembo, who can tell you the horror of the hours and day following. It was ten o'clock that evening when we landed at Tucson. Not at the old Tucson which used to lie in the desert here (look at the map); but at the new Tucson forty miles away in the Catalina mountains. The place was seething with excitement. Crowds thronged the wide thoroughfares and the great parks listening to the dispensing machines blaring forth sensational items. Old-fashioned extras were being turned out by the thousands and sold on the streets.

A bomb had fallen in Kansas, another in the wheat fields of Ohio. Only meagre news was coming through from the east. Rumor had it that New York and Boston were totally destroyed. At my Mount Lemon home—I had several such homes scattered throughout the country—we landed, and for the time being were safe and comfortable. Artificial sunlight flooded the rooms, servants went to and fro preparing delicious foods. You, Bilembo, can have no conception of what I mean.

It was on the tele-screen that I viewed the mobs coursing through the streets; via the news-dispenser I listened to the latest tidings from all over the country. Terrible, they were terrible, and yet a feeling of peace and security began to pervade my mind. By this time, I reasoned, the enemy rocket ships must have passed or been met by our own defense rockets and shot down. In any event no more bombs would be dropped, and we who had fled to havens of safety were in no further danger.

Suffering there would continue to be, of course, for a few weeks or months, panic, chaos; but inevitably the government, both state and federal, would soon control the situation, succor those made homeless, protect property and life, bring order out of disorder. Yes, I thought with a prayer of thanksgiving, the worst was over; only days of reconstruction lay ahead. With these thoughts I comforted my hysterical wife, sent her to bed in the care of a maid, with Williams' help quieted the fears of the servants. In the end I went serenely enough to my own couch, never dreaming, never suspecting . . .

That was a curious characteristic of the average citizen of those days, Bilembo, a child-like faith in the omni-

potence of the powers that were. Though everywhere throughout the civilized world scientists wrote and delivered lectures on the dangers of chemical warfare, though pacifists went around denouncing war and minority groups pointed out the menace national greeds were to world civilization, he let what was said go in one ear and out the other. He was heedless of everything but the day's routine, the little round of business, quite certain that anyone not sharing his stupid optimism was a crass alarmist.

He was confident the heads of government, the responsible men of every nation, would avert disaster, never dare to loose upon mankind the engines of destruction about which talk was bandied. Incredible but true! So I went to bed believing the worst over; still trusting blindly in the strength and leadership of those whose greed and stupidity had sowed the wind and left me and my kind to reap the whirlwind.

It was not until noon of the next day, with the coming of Brownson, that I began to realize the awfulness of what was still to happen. He limped down from the sky, himself and his wife, haggard, gaunt.

"A shell fell into the sea near San Francisco," he said, "and recurrent explosions washed the streets of that town with giant waves from the Pacific. Large buildings withstood the force of the waters, of course, but not the terribleness of explosive gases washed in by them."

He went on to say that from the observation porch of his laboratory in Oakland—that central metropolis of the huge East Bay city of five million people—he had witnessed the overwhelming destruction of the proud warden of the Golden Gate. He had seen buildings vanish like golden vapor, viewed thousands of terrified fugitives take to the air. Then as the churning, exploding waters swept over the doomed city of the peninsula and on into the Bay, bearing their deadly, erupting contents Oakland-wards, he had soared aloft in his modest duplex-eight.

Brownson's laboratory had been an endowed one but he was a poor man. He employed no servant or pilot. The plane damaged itself making a forced landing in the desert, where he had spent the night. Fortunately a passing pilot helped him make temporary repairs.

"I was bewildered," he said, "at a loss where to go; then I remembered this lodge, felt sure you'd make for it yourself—and so here I am."

CHAPTER III

The End of Civilization

His story plunged us into renewed gloom.

"You think Oakland was also destroyed?" I asked.

"Yes."

"But that explosive gas cannot keep spreading forever. There must be limits to its expansion."

"True. But how are we to know what those limits are—and when it will stop exploding?"

"What do you mean?"

"Have you forgotten? Two years ago the English boasted of inventing an explosive gas which once loosed would continue exploding for twenty years or more. This French stuff shows similar characteristics—probably stolen from the English."

"Good God!" I stared at him, appalled. At that moment Williams turned on the news-dispensing machine. A mechanical voice coughed, spoke, finished a half-uttered phrase, and we picked up the sense of what was being broadcasted with the beginning of the next sentence.

"There is no need for further alarm. The president and his cabinet have organized the seat of government at Omaha. Army headquarters announce one enemy rocket shot down in Massachusetts. Two others badly injured have veered from their course into Canada. A fourth continued on into the Atlantic. Martial law proclaimed throughout the nation. Regular army units en route to scenes of disaster. All state troops mobilized. Reserve soldiers and army and navy officers recalled to the colors."

More information, there was, of less importance, an announcement that further news would be broadcasted at half-hour intervals during the day, and then silence.

"You see," I said, "the worst is over."

"Alas," answered Brownson, "it has but begun!"

Beyond a curtained doorway I saw the pale faces of the servants, the phlegmatic countenance of Williams, witnessed Latham, forgetful of where he was, nervously light a cigarette and blow out clouds of smoke. My wife's fingers tightened painfully on my arm.

"Germs," said Brownson tensely. "Spanish influenza, bubonic plague, God knows what!

"Good God, man!" he cried, "don't you understand? Cultures of virulent germs combining the properties of all deadly diseases were prepared for use in warfare, and—" he shook a fateful hand—"the nation that did that was France, her special bombs designed not only to blow up, asphyxiate, have burst over our country, and the germs . . .

"My God!" he cried, "they will sweep the world!"

Plague! Like a sinister breath it swept the land. All over the country people were dying of a strange malady. What took place in various cities and centers of population is a matter of conjecture; but before the news-exchanges were utterly disrupted enough tidings came through to give an inkling of the terrible things that were happening. There was rioting in Seattle and St. Louis, looting in Chicago; eastward from the Pacific coast and westward from the Atlantic seaboard, panic-stricken mobs were pouring inland. Millions died when the powerhouses ceased to function. But what can I say of those awful days but that workers abandoned the factories, citizens the town, that the dead were left to fester where they fell, and that city was cut off from communication with city, and state from state.

Never will I forget the coming of the plague to Tucson. Men, women and children fell in the streets like flies. The frantic attempts of the medical authorities to organize treatment and relief were swept away in a moment. Doctors succumbed over their patients. The plague was a terrible thing. Nine-tenths of those whom it attacked died—horribly. But here and there were some individuals immune to the disease, and others who actually survived after being stricken. Brownson, his wife, Latham, the three maid-servants and two footmen, died; but my wife and Williams recovered from their attacks, and I was never taken sick at all.

It was impossible to bury the dead. Cities became vast charnel houses. Railroads and aerial freight ships ceased to function, food became scarce, famine, and pestilences other than that of the plague, desolated the land, and

bands of homeless and desperate people roamed the countryside and lived or died miserably.

But it was the fog-balls that completed the demoralization of civilized man. That they emanated from the explosive gas the French rocket ships had loosed was undoubted. Driven this way or that by the prevailing winds, raggedly spherical in shape, their gray and thunderous masses tinged a sulphurous yellow, they carried within themselves lethal death, and hundreds of thousands of fugitives upon whom they settled were overwhelmed and wiped out.

● For months they proved a nightmare; but in time grew less numerous and large, so that it soon became possible to watch out for and avoid them. You have never seen a fog-ball? No, because years ago they disappeared from this part of the country. Pray God that they never come back! But in the days that I am speaking of they finished the work of destruction the plague had begun. Think of it! Less than two hundred years had raised America to the top as the greatest industrial nation of the twentieth century—and in six weeks she was swept away!

Lemuria, Atlantis—all the mythological civilizations—had passed like a dream; and would the story of my day survive but as a myth; would . . .

No, I can't tell you about Lemuria and Atlantis. They were but legendary continents. Perhaps greed and war wiped them out as they wiped out my own civilized era. But I won't dwell on that. Nor will I dwell too much on the horrors immediately following the plague. Suffice it to say that my wife, Williams, and myself, threatened by a fog-ball, fled from Mount Lemon.

At first we traveled in the Damler, but somewhere in the wilderness our fuel gave out and we were forced to land. For months we lived precariously, God knows how, killing stray cattle, rooting in deserted fields and farmhouses, hunting, fishing.

The first winter we passed in an abandoned cabin. I was of little help. If it hadn't been for the ingenuity of Williams we should have perished. The next summer several men joined us—wild, rough-looking fellows, but no wilder or rougher-looking than were we ourselves. One was a bank manager, another a teacher of languages; as for the rest they had been farmers and unskilled workers.

A band of ten men and one woman we roamed from place to place, avoiding towns and villages, for these were filthy with unburied corpses, living a nomadic life. In the course of time our tribe increased to the number of fifty, with several women among the newcomers. Of this tribe Williams was the undisputed leader. Almost imperceptibly his manner towards me altered.

In the first days of our new existence he deferred to me, still the perfect servant; but as our hardships increased, as more and more the comfort and safety of our little group devolved on himself, he assumed the attitude of an equal, indeed of one who gave orders and expected to be obeyed. Only once had his authority been questioned. For some time there was a noticeable sullenness among the men. Lowering looks were cast at myself and other wedded members of the band.

An evening came when one of the disgruntled bachelors caught at my wife and kissed her violently. I flung myself at his throat with a curse, but he had no difficulty in overcoming my attack. When I finally staggered to my feet, dazed and bleeding, it was to discover Williams confronting my assailant.

"Ho!" the latter was crying, "so you think yourself the high-muck-amuck around here, eh? Well, you can't tell me where to head off at, see, you ex-flunkey! I'm going to be the boss of this show from now on, or I'll know the reason why."

Williams stood with one hand stuck in his ragged jacket.

"You'll do as I say," he said levelly.

They were both big men, nearly of a size, the malcontent perhaps more powerfully built.

"Will I?" he said, laughing contemptuously, and leaped forward, fists swinging. Williams' hand came from under his jacket with something glinting in its grasp. Quite coolly he stepped back; there was a sharp report. With a look of foolish surprise on his slack face the rebel faltered, turned slowly around as if to find a place on which to fall, and then tumbled headlong without a groan. There was a moment of stunned silence.

"If there are any others want to take up his quarrel," said Williams bleakly.

No one stirred, eyes shifted before the deadly menace in his green orbs.

"All right, then," said Williams. "I'm sorry I had to shoot Green; but I'm leader, and I won't stand for lawless violence."

He shoved the gun back into his bosom.

"From now on we're going to do things in orderly and disciplined fashion. You have a grievance? Very well. Select a spokesman and let him step forward and speak for you all."

After some muttered discussion, a truculent fellow advanced.

"It's the women," he said succintly.

"The women?"

"It ain't fair, under present conditions, that a few men should possess all there are."

Williams looked grave. "I expected something like this." Then he turned and addressed the listening women.

"To all intents and purposes we people represent a whole tribe, a nation, faced with the necessity of adapting ourselves to a new and raw environment, faced with the necessity of evolving new codes of conduct—if we are to survive as a social body and not be destroyed through anarchy and bloodshed. For the old world has passed away forever, and the new . . ."

CHAPTER IV

A New Leader

● He was silent a moment.

"There is justice in what the men say. But the decision remains with the women. Only in making their decision let them not forget that our existence depends on it. Tomorrow we shall have a meeting . . ."

And that, Bilembo, is why our tribe practices polyandry today, though the origin of the custom be forgotten. No, it wasn't always practiced. In the lost civilization I am telling you about monogamy—one man to one woman—was the custom. But I shall not dwell on what must be confusing to your mind. That the women of today select

(*Continued on Page* 375)

(*Illustration by Paul*)

The pale beams struck the bound men full in the face. Where heads had been were cinders. Toppling bodies were caught and hurled into the vine-net.

RED FLAME OF VENUS

By P. SCHUYLER MILLER

• The tales that Bill Bradley can and will tell on the slightest provocation may seem preposterous to one who is used to the trodden ways of the System. But when there were no trodden ways and Bill Bradley was a rookie in the newly-formed Space Patrol—well, things were different then.

We, who are used to the little eccentricities of the Venusians, so greatly modified by their contact with us during the past half century, can scarcely imagine them and their planet as they were in those early days. Only at rare intervals do we get an inkling of what the first space-rovers had to deal with—such as is given by Bill Bradley's tale of the "Flame Orchid."

It seems that he was on some sort of special duty at the time. He never knew exactly what he was supposed to be doing. You see, the Patrol had a rather keen-minded Commandant who was in the habit of picking young, intelligent men out of the rank and file of the Service, planting them in some out of the way spot where things seemed to be not exactly as they should be and where there were no grounds for official action and letting their intuition and initiative do the rest. Many a wild goose had been tamed and spitted by this process, and Bill's case is no exception, though his results are a bit unusual.

At the moment, he was hanging around the imperial palace in Laxa. Perhaps it will be well to say a few words about the place, so as to make Bill's subsequent adventures a little more lucid.

Laxa is perched on the edge of the great sub-sea peninsula of the Western Continent of Venus. An enormous area of land, bounded on all sides by sheer basalt cliffs, dropping two thousand feet to a bottomless sea, was set aside by the first emperors of the united planet as a floral preserve. As I have said, most of it is below sea level, and consequently swampy. The edges, though, and the tongue of rising land nearest Laxa, are more or less open forest, interspersed with grassy meadows and a few conical peaks. In six centuries of study, Venusian scientists have barely touched its possibilities. Sheer paradise and fetid, reeking hell lie together in the royal gardens of Laxa.

There is a reason why this last stronghold of nature on Venus has been practically untouched, save at the more accessible parts of its border. It is the same reason that has practically barred aircraft from the Venusian skies, and that had precluded the possibility of space travel until the time our first expedition landed in these same forbidding gardens. No Venusian subject may stand higher than his emperor. And thereby hangs a matter of some importance to our tale. But it will be best to start at the beginning.

• The fans of A. Merritt, who repeatedly call for more of his stories, will glory in this colorful and exciting tale of Mr. Miller. We are plunged into an intrigue of a new world, into a mystery of mysteries in which strange, almost unbelievable events occur.

To solve the mystery one must be cool-minded, cold-blooded, free from superstition of fear. And who but an Earth-man, possessing Earth science, and fearlessness could plunge into the swamps of Venusian superstition to unravel a great plot?

It will be dangerous work, as Mr. Miller himself explains, for people of one planet to "mix in another planet's pies." But if, as Mr. Miller believes, the planets will eventually be tied together, and be affected by similar causes, then such interplanetary intrigues as this may actually take place.

Bill's "vacation" had been given the background of Laxa's royal palace where the emperor and his family were holding court. Something—and he could not even hope to name it—was wrong in that palace. He was doing his level best to sense it and hunt it out and then, of course, events would shape themselves. Bill Bradley usually lived from day to day.

He was camped in the roomy hollow of a huge *billao* tree just beyond the back doors of the palace, well within the triple walls. If his experience and technique meant anything, he would soon be camping inside the palace itself. But he had not counted on circumstances.

Bill Bradley, young, handsome, utterly frank and incurably romantic, was waiting in the shrubbery beside a certain little door, when it swung softly open. Casting a quick glance about him, he slipped inside and glided up a narrow passage cut in the thickness of the massive outer wall. There was nothing mysterious about it, though, for it led openly and directly to a second, larger door which in turn let him into the royal kitchens.

There was more than food waiting for him. He had picked her up at one of the innumerable Venusian festivals, a really delectable bit of Venusian girlhood of the darker type. Bill preferred blondes as a rule, but her jet-black curls, her long lashes, her deep blue eyes and ruby lips had captivated him at once. And when he found

that in three days she would enter into service in the royal household—well, she was simply God-sent!

Food could wait. He seized her in an embrace that is approved by feminine connoisseurs on every planet of the System. He was very strong and very Earthmanish. He knew she liked it, and he didn't mind it himself, for she *was* darned nice. And could those royal cooks cook!

He had ample proof of their skill now. Snuggled in a corner of a divan in the apparently deserted servants' dining hall, the pair devoted themselves to a combination of royal love and royal menu. Some combination! Bill felt more contented than he had in years. Maybe some day, when he was retired on a pension, he'd come back here and—but pshaw, she'd have a raft of kids by then. He returned to matters at hand.

He waved an inquiring hand about him. "The rest—where?" he queried. He hadn't expected to be seen, but he had certainly not expected to be in a deserted suite.

She didn't seem to know and didn't care much. She pouted coyly up at him and snuggled closer, and he reacted in a way calculated to bring little wriggles and squeals of outraged delight.

He ventured a few remarks: "Pretty roomy place, this?" Decidedly. She was lost in it. "Lots of places no one ever goes?" Many. A man—a man could hide for days and weeks, undisturbed, if he knew his way about. "He'd need a pretty good guide, to show him the lay of the land." But certainly! "One who was in service here, for instance." Yes—coyly. He brought a forceful end to her giggles.

He changed his angle of attack. "Pretty cold nights, outside." Ah, indeed. Very. "He'd had a devil of a time the last few nights." Poor, poor man! He didn't react this time. He shuddered, let her hand fall. "He'd been feeling rotten—fever coming on, maybe." Oh! *Poor man!* He went right to the point. "He'd have to leave, right off, unless—" Unless? "Unless he could find real shelter somewhere."

She sat up very straight, her big blue eyes thoughtful, and digested that statement. She was no fool. He'd laid his cards out on the table, and her eyes were wide open. For all the roominess of the palace, it would be a pretty ticklish business. Suppose he was found here? Suppose Barto, the major-domo should find him! Suppose *Rillo* should find him! She went a bit pale. Rillo was rich, and Rillo was ardent, but this Earthman, this Beel—he was so very big and strong and warm! After all, Rillo had no call to be snooping around where he wasn't wanted. She cuddled up against Bill's broad chest, pulled his big ear down to her lips, and whispered her assent. His great, strong arms encircled her and she shuddered with delight. So big he was, and strong!

● He approved that shudder. The tensing shiver that came after it spelt trouble. He dropped her, sprang to his feet, and whirled to face the door. Tall, blonde, statuesque, the eldest daughter of the Venusian emperor was framed between its gilded posts, flanked by two giant guardsmen and backed by a horde of gabbling, scandalized servants. The lady of the house, come to inspect her kitchens. The maid on the policeman's lap. How many times has the situation seemed funny?

It was more than funny now. Bill swears it was sheer instinct. The blink of an eye and he was in love again. Three long, quick strides and he had clasped her rigid form in his arms and was pressing a brutal, burning kiss on her parted lips. In a trice he had flung himself on the floor at her feet in deepest obeisance, just as the two inevitable fans of sizzling energy crossed where his brain had been. His fingers sought her white ankles. His lips were seeking out her tiny, pink-nailed toes. Bill Bradley has always spelled Tact with an emphatic capital T.

She drew her foot away, not too abruptly. She waved back the guards imperiously. She stood, very regal and very beautiful, in the doorway.

"Come up," she commanded.

Bill came, joyfully, eagerly. Too eagerly, it seemed. Once was enough, for now.

"No!" she cried. "Go back! Guards!"

They leaped grinning to do her bidding. Bill struggled appropriately, but they were very large. He looked at her reproachfully and noted with satisfaction that she was weakening. But Bill has brains. He turned to the cowering maid.

"Farewell, my Zara!" he cried.

The princess stamped her foot in sudden anger.

"Guards!" she ordered. "To the dungeons with him!"

In one of the dryest, roomiest cells that the imperial dungeons could offer—for it seems that even guardsmen have eyes and brains—Bill Bradley lay back on the polished stone ledge that served him for a bed and grinned happily and a bit dreamily at the moist ceiling.

Boy, what a woman! A blonde among blondes—only Venus could make 'em like that, and only a royal family could produce this one! Pale gold hair and lots of it—skin like a lily petal—lips like Martian rubies—eyes like the Mediterranean of Earth in June! And had he played his trumps where they belonged? There had been a year or two in space before he had joined the Service, and not a few weeks in various ports since. Bill Bradley had technique.

He repeated that fact to himself with growing satisfaction as, along toward evening of the next day, the same two guards came to get him. There seemed to be the ghost of a smile lurking behind their blank visages—a glimmer of understanding that he welcomed with inner glee. Nice work, Bill, old boy. And it wasn't all policy. Bill Bradley, as he admitted to himself, was in love again.

The symptoms were all there, as they had always been. His heart began accelerating, until as he stood alone before two crimson curtains it was leaping as if to tear itself out of his breast. His hands and brow were damp, and his knees a bit trembly. Buck fever, he told himself. He always had it.

He didn't notice that it was Zara who drew the curtains aside. He looked beyond, to the glorious creature who stood before the window, her back rigidly toward him. Beside her was a lean and rather pale Venusian youth, chewing his lip and trying to make small-talk with no notable success. Bill's head cleared and he snapped into mental alertness. Game was sighted—fever gone. The princess—Noreena, she was—heard the swish of the portieres. She turned to the uneasy youth at her side.

"Rillo dear," she murmured, "*do* see who that is."

Rillo? Ho! Bill's brain was still a couple of jumps ahead of the situation. He laid a hand on Zara's shoulder as the youth turned, brushing her black curls carelessly with his knuckles. Out of the corner of his eye he saw

that she was deathly pale. Rillo too. As for the princess, she was still disinterested.

Rillo came forward, his eyes blazing, his lips set. Bill gave Zara a friendly little pat on the shoulder and strode easily to meet him, hands in pocket. He forestalled the other's question.

"Your Highness desired my presence?" he asked coldly.

Rillo gasped. There was a scared stir from Zara's direction. And Noreena whirled like a flash, her eyes afire with sapphire wrath.

"Yes!" she snapped. "I was curious! I am amused by strange beasts from other planets!"

She came toward him, stood a few paces away staring insolently at him from under lowered lids. Rillo had drawn aside, behind him. Bill tottered a little on his feet, closed his eyes. His lips parted in the softest of whispers.

"God!" he breathed. "Beautiful!"

She heard. She was meant to. Her eyes came wide open.

"What was that?" she cried.

"Highness?" he stammered, as if wakened from a dream. "You ask me—?"

"What did you say?" she repeated.

"I, Princess? It was nothing. I—I was a little dizzy. I said nothing."

She knew better. "What?" she demanded.

He shifted uneasily on his feet. He half turned to look at Rillo and Zara. "I—I cannot say," he told her. "It was nothing. I was not thinking of what I said."

For a moment she stared at him, quizzically. He twisted guiltily under her gaze. Suddenly she turned to the others. *"Tsot!"* she hissed. "Go!"

Zara hesitated at the door and looked back. The faintest of smiles crept over Bill's features, and neither Rillo nor Noreena missed it. The Venusian wheeled and strode angrily out of the room, shoving Zara ahead of him. Bill heard some angrily whispered remark and her pleading whimper. Then he was alone with his princess. And there was anger in her eyes again.

"Well?" she snapped.

He stood as if petrified. A lump seemed to rise in his throat, a mist to cloud his vision. He swallowed. He blinked dazedly. His fists were white-knuckled. He half raised them, took a step toward her.

"Princess—" he muttered, choked, stopped.

"Well?" She was melting again.

"Princess! Noreena!" He stumbled forward and fell on his knees at her feet. He seized her cool hands in his, pressed them to his lips. Then, feverishly, frenziedly, he began to speak, his voice low and impassioned. The words flowed in lissome magic from his tongue—mad, hot words of adoration. He prayed to all the gods of space that she wasn't up on Earthly religions. He was reciting, "with dramatic inflection", the Songs of Solomon.

Bill had spent ten consecutive hours memorizing that particular bit of poetry, in preparation for his seige of Zara. But here, now—he really meant some of it, a lot of it. He could put real feeling in his declamation. And he did. And it went over big!

P. Schuyler Miller

● We can afford to let a few days—weeks, even—slip by.

William Bradley, who, for reasons yet obscure, even to him, had attempted the conquest of the maid, had become the constant shadow of the mistress. And, being William Bradley, heart and head were displaying some marvelous team-work. Noreena never had a chance.

Perhaps, you may say, she was remarkably lacking in common sense. Today she would not have fallen for Bill's line, nor on Earth then. You may be right. The Venusians of that day were really very simple in some respects, like the Earth-women of the early twentieth century. And yet—could the instincts that she shared with every thinking female creature in the Solar System have failed her here? I have a thought, at least, to offer. What if she did see through all Bill's romantic flummery to the clear, clever, practical brain behind the impulsive heart? What if she did realize that he was using her as a tool, a key to the palace? It was novel, it was nice, and she liked it. What more do you want?

At any rate, Bill found himself in a rather peculiar position. Seemingly half the servants knew his status—which was more than he did—and the other half didn't even know he existed. It was the same way with the guards, the nobles of the court—even with the royal family. He has never figured out just what he was supposed to be. Presumably, from their extreme tact, the courtiers hoped for the worst.

On the other hand the pair of them were quite apt to go off into a spasm of passionate love-making just for the fun of leaving the circle of "chosen" confidants gaping bewilderedly at the romantic byplay. They would dash from the deepest of veiled metaphor to the baldest frankness, utterly without warning, that like as not would yank out an O. Henry ending like a jack-in-the-box, leaving the dazed courtiers laughing dutifully while Bill and his princess grinned understandingly at their puzzlement.

If I may inject an opinion, they were both bored stiff with the routine of their respective jobs, were attracted to each other both physically and mentally, and were playing a game of skill and daring with a verve and vigor that left the rather stodgy Venusian court miles behind. To be quite Earthly in idiom, they were having one hell of a good time, as only highly intelligent and perfectly congenial people can.

It had long ago been realized that Martians and Earthmen, having been born and bred millions of miles above the heads of the Venusian imperial family, could not by any rule of logic be brought under the imperial prohibition. They were by nature exempt. And when it became evident that Venusians were bound to take an active part in space life, a brilliant legal quirk of the emperor himself provided chameleon-like citizenship papers for space-minded Venusians, whereby they became citizens of Earth or Mars or some appropriate asteroid until they were safely back under the eye of their emperor.

But I am digressing again. Bill Bradley was Earth-born, and at times he made quite a point of defying the edict, towering over Noreena like a veritable giant by vir-

tue of some trick of posture. She was really just about as tall as he. At any rate, he had moved from his hollow tree beside the kitchen door, and, for reasons of his own, had pitched camp on the outside of the palace, a hundred feet or so above Noreena's window, where nobody would think of looking for him. Venusian palaces are pretty ornate, and he had a recess the size of a small room, fully equipped with hammock and light-globes, hidden from the eyes of the world by a cunningly camouflaged canvas screen. The foremost artist of all Venus had executed that screen, at the command of the emperor, who never to his dying day knew what he wanted it for. As I have said, Noreena quite matched Bill in brilliance. They were a pair to be proud of!

On the day of which I write, along toward evening, Bill was sitting on the edge of his cot, thinking. Noreena's attitude had been puzzling of late. She was tantalizingly capricious and variable in temper. In one moment she would be the aloof, prudish Venusian princess of convention and he a worm under her heel, and then without the slightest warning she was back on the old, riotous standard, dueling with word and deed in a way that no ordinary Venusian could hope to comprehend. At times she would be glum and moody, deeply mysterious, and again she was light and frothy as a bit of thistle-down. He began to suspect that the situation was getting out of hand, and he didn't like it in the least.

He heard voices, laughter, below him, coming from the direction of one of Noreena's favorite tree-top bowers. Then something hit his canvas roof with a thud and slithered off into space. An instant, and a second something followed the first—a third—two together. He got up and raised a small flap in the canvas, his window to the outer world. Something bounded off the carved stone beside him and whizzed past just before his nose. He craned his neck a little to look down at the garden. He'd guessed it right. Noreena and her court were shooting bats.

The great brick-red fruit bats of Venus are ugly but harmless. Every nook and cranny of the upper palace was alive with them. Bill had driven hundreds of them out of his particular recess when he took possession. From the tree-tops, with the dying sun illuminating them fitfully, they made excellent targets for the long-range ray-rifles of the courtiers, who were mostly good shots. Noreena herself was one of the best in the entire System.

Her sharp eyes had spied the motion of his little flap. Perhaps she had been watching for it. Her white arm was raised in a mocking gesture of greeting and then in an instant she had outlined his body with a great arching U of ray-dots, needle-pricks of light where the sunset shone through. Noreena could shoot.

The sun was fast sinking and now the real sport began. The other had been but dalliance for the better shots of the court, a condescension to the poorer marksmen. Now, with the great red bats mere drifting shadows against the dark clouds, Noreena and her little group began to exhibit real skill.

CHAPTER II

The Coming of the Flower

● There were not many who stayed for this phase of the sport. Court etiquette permitted them to seek more congenial surroundings, and most of them took advantage of it. To a poor marksman, utter skill is annoying. But Noreena and a handful of her court still stayed on, and the air was alive with their stabbing rays, glowing with fleeting blue fire along their ionized tracks. The huge trees in which they were concealed seemed to be hung with clustering fruit as here and there the blue globes that cling about a ray's electrode blossomed and faded. And Noreena did not forget her watcher behind the canvas. Skillfully she would send up a fanning burst of light that showed the little flap still open, and on its heels a sheet of blue fire would sing around Bill's ears. He only grinned. She knew her guns. He was perfectly safe.

That was where he made his mistake. Noreena was not the only pebble on the beach. Next to her a tall, gaunt Venusian of the dark race, sparsely bearded, had been lying on his little platform among the branches. He was an excellent shot too, and Bill tried in vain to place him. Try as he would he could form no association. The man was an utter stranger.

From where he lay behind the princess a queer beam of flickering red light went up for an instant, then faded slowly away. Bill wondered whether he had really seen it. He had. Beyond, at the very edge of the real jungle, a ball of greenish fire blossomed and he felt the electric tension of a ray singing past his ear. One, two, three in rapid-fire order the strange ray flowered. The first missed. The second drilled his arm. The third passed where his heart had been.

Swearing vividly under his breath, Bill lay on the floor of his hideout, clinging to his numbed arm. It was one of those infernal non-ionizing rays that left no track and both burned and jolted. There was dirty work in the offing.

The thing evidently was being run on some sort of three-contact hand generator, as a ray of that range would have to be. He lay quiet in the dark listening to the buzz of the energy-charges zipping through the tough canvas—three and three and three, drilling a breast-high line across the front of his hiding place. Where they hit the stone of the wall, it glowed momentarily, and he reasoned that this would show the hidden sniper when he passed beyond the concealed crevice. It did.

Three feet lower, the burst of energy returned, swinging just above his head. It vanished, then reappeared at the top, drilling a neat line of pin-pricks down the canvas front of the niche, directly above him. Frantically he rolled aside and wriggled down into a sort of tunnel behind one of the great stone statues that decorated the palace-front. They were out to get him!

Some twenty feet farther down he stretched out on a narrow shelf and watched the sniping with interest. Whoever had engineered it left nothing to chance. After the horizontal and vertical lacing was finished, they started on diagonals. They meant to get him and get him right! Well, let 'em try.

Noreena was still sending occasional darts of energy in the direction of his former shelter, though, now that the flap was down, she aimed only at places where he could not be. The others had no such consideration for his peace of mind. Coldly and methodically they went on with their dissection of that canvas surface. Then something happened that changed things considerably.

By sheer chance, Noreena's visible shaft crossed one of the non-ionizing beams, close to the face of the building. There was a crackle of electric fire, a blaze of white light, and Bill saw her electrode burst into flame, the metal burning like paper under the impact of the invisible energy. With a little cry she threw her gun from her, just as its bulb exploded with a glare of vivid violet light. In the faint glow from the city lights, he saw her standing erect on her platform, staring out over the trees at the place where the ray-projector was still flashing—three, and three, and three—hurling its deadly darts of energy at some unseen target. She whirled about, just as the beam overshot its mark, outlined three little green dots on the stone of the palace wall, and began its return trip.

She cried out in anger. Bill heard a man's voice answer, low and silken, from beside her. Again that flicker of red light went up from the tree-top. She saw it, asked some sharp question. There was a suave reply that seemed to satisfy her. Bill didn't like that man.

Her voice rose in a curt command. Lights blazed all over the garden. He saw men and women rising to their feet in the foliage and climbing down swaying ladders. Noreena was the last to go, in accordance with the imperial law. For a moment she stood there, waist-deep in the dark leaves, staring at the palace. She raised her arm, questioningly. From Bill's shoulder flashed a tiny dot of light, green, red, then green again. Again her arm came up, and then she went down into the tree. In a moment he saw her leading her little group across the lawns. A knot of the royal guards met her, saluted, then stalked off toward the jungle. The procession vanished under the bulge of the palace wall.

Noreena of Venus stood alone, brooding, beside the curtained windows of her audience chamber. At its far end little groups of courtiers were whispering excitedly among themselves. Suddenly they stilled, all agog as an officer of the Guards entered. She went to meet him, asked some question in a low tone. His head bent in silent negation. He had found nothing. Noreena waved him away, and turned back to her window.

A man was standing before the curtains. No one had seen him come, but most of them recognized him—the Earthman, Beel. Now there would be more of that bewildering, rather disturbing bickering between the two, crammed with allusions that passed completely over their heads. They stirred uneasily. They did not quite approve of it.

But tonight neither Bill nor Noreena was in the mood for quippery. Bill's right arm was stiff and sore, with a charred needle-thrust through bone and muscle, and Noreena's hands were blistered. Things that should not be, were.

● They stood there morosely, side by side, staring out into the dark toward the untrodden jungles whence that invisible shaft had stabbed. Bill broke the silence, jerking a thumb back over his shoulder toward an alcove where the lean, sleek stranger of the evening's entertainment was lounging on a cushioned couch.

"Who's that?" he asked. "I've never seen him around here before."

"No," she replied, "he has just come—from where I do not know. He is Atampa, a noble of one of our oldest families. He dabbles in science, and in religions."

"He was with you before, wasn't he?" Bill urged her.

"Yes, during the shooting. He is an excellent shot with the ray."

"Seemed like he had some kind of flare that he used a couple of times."

"Once only, that I saw. It is some ray of his own devising, undeveloped as yet. He turned it on those who attacked you and short-circuited their projector, so he said. My Guards found scorched leaves and some fused crystal."

"Um." Bill let it go at that. He was willing to wait a bit, and see how things panned out. He had been watching this Atampa out of the corner of his eye, wondering why he kept to himself the way he did. That alcove—wasn't there a door there somewhere, behind the draperies? He turned to Noreena to ask her, only to snap his gaze back to the lounging noble. There had been some sudden movement—a stir of the hangings—something that drew his eye. He stiffened. Atampa was fingering a huge crimson flower.

He turned to the princess. "He is a botanist, this Atampa?" he asked.

"A botanist? He has gardens, as we all have. He has some rare plants that most of us have not."

Bill hesitated. Better be careful. Then: "I think he has brought a rare blossom in your honor, Princess. It is one I have not seen in your gardens."

She looked up at him, puzzled, sensing something hidden in his words. She turned and looked where he was pointing. She stiffened. Bill sensed mystery.

"Come on," he said, "let's go over and look at it."

Together they moved across the room toward the unsuspecting noble. His back was to them, and he seemed very much engrossed in the great flower. Bill's heel scuffed on the floor, and Atampa sprang to his feet, his eyes sharp and wary, his face suddenly pale beneath his sparse beard. Seeing Noreena he bowed deeply and stepped aside to let her pass, directly into Bill's path. A little red glow of warning rose in the Earthman's eyes, burned for an instant, and flickered out.

"The Princess Noreena has come to see the flower you brought her," he said.

There was danger in Atampa's narrowed eyes, but when he turned to the princess it was veiled by his suave, oily smile. He bowed and held out the flower.

"Highness," he said, "only the winds know whence this blossom came, the winds and the sea. There is none like it known to science today, though it may be that the ancients knew it. I brought it with me tonight that your Highness might wear it, so."

He held it to her shoulder. Against the white skin it burned like a great, licking flame, deeply crimson, with a heart of angry scarlet and fretted filaments of gold and orange like little thrusting tongues of fire springing up about its throat. Its fore-thrusting lip was a vivid vermilion, dotted lightly with gold and fringed with the little flame-tongues. It was beautiful, yet in some way angry and sinister. A little chill wormed its way up Bill's spine.

Noreena was strangely rigid, staring with unseeing eyes at and through the great bloom. At Bill's voice she came to herself with a flush of embarrassment.

"Maybe there'll be mention of it in the records of some of the old families," he commented. "It happens like

that on Earth lots of times. Old legends and superstitions crop up that prove a thing has been known for centuries."

Their reaction to his words was curious. Noreena's face was drained of blood, leaving her like a marble mask, frozen with hidden dread. Atampa was trembling with rage, his face a thundercloud, his eyes blazing. Something funny here!

With an effort the Venusian regained his poise. He answered Bill, huskily, as if his voice were not quite under control.

"It may well be," he said. "Yet I know of no such legend, and my line is as old as her Highness's. You know of none, Princess?"

There was a definite menace in his voice, but she ignored it. Instead, she posed a question of her own, looking at neither of them as she spoke.

"What name would you give it?" she asked slowly.

Baffled rage seethed behind Atampa's eyes. His lips were thin and straight, pressed tightly together. He was like one whose cleverest move has been played by his opponent. Somehow, out of somewhere, a single word burned in Bill's brain, and three words of translation.

"*Taramantha*," he murmured. "The Flame Orchid."

A stifled cry rose to Atampa's lips, and Noreena swayed in her seat. The great orchid dropped into her lap. Then, recovering instantly, she rose to her feet, making a gesture of dismissal.

"It is a name as beautiful as the blossom itself, Beel," she said. "I would give much to find the plant from which it fell, but that may not be. And now, I think, I will go. I am not well."

As she moved forward, the orchid, caught in the folds of her gown, freed itself and dropped to the floor. Instantly Bill pounced on it and knelt before her. Bending his head, he kissed the great flower's protruding lip, then raised it to her. A queer expression crept over his face. He ran his tongue lightly over his lips, then, as she took the blossom from him, he seized her hand and pressed it to them. Yet it was the orchid that he kissed, not her hand. And then she was gone.

Atampa bowed coldly. Bill rose slowly to his feet, a subdued light in his eyes.

"Some servant brought you the flower, Atampa?" he queried.

The Venusian glared his disgust. This groveling Earth-beast! Yet he answered civilly enough.

"I found it myself, Earthling," he said, "floating in the sea beneath the western cliffs. No menial has touched the blossom that I offer to my princess!"

"Sure," Bill agreed. "I get you. I just wondered. It's sure some fine flower, anyway, wherever it came from. Too bad someone can't find it for her Highness. Well, I guess maybe it's time I got going. See you again."

● Bill stood watching him, licking his lips thoughtfully. His hand slipped down behind the hangings, found the latch of the hidden door. He drew back into a corner of the alcove and vanished under the heavy draperies. As he slipped along close to the wall of the narrow corridor he savored again the strange salt flavor that had been on the lip of the orchid. There were little black spots—some foreign matter—on it. They might have been crusted salt from the sea, but they weren't. The orchid had never been in water. Those dark flecks were blood—*the blood of an Earth-born man!*

Shortly before dawn, the watcher in the tree-top saw a strangely shaped shadow flitting up the carven face of the palace, up and up toward the lowering clouds, higher than any building of Earth, higher than any man of Venus, up to the great fretted golden sphere that topped the imperial palace. Like a fly on that sheer wall, Bill Bradley crept upward through the dark, clinging to the deep-cut granite filigree, finding easy footholds in the maze of bold reliefs.

The watcher in the tree was a poor marksman. His rifle bore its globular fruit of flame and the invisible shaft of death darted forth to trace a little pattern of glowing dots about the moving shadow. Suddenly it dropped, ten feet or more, to hang limply over a jutting pinnacle of stone. The little green dots raced triumphantly down the face of the palace toward him, then suddenly a shaft of pale light split the air and in the tree-top a glowing globe of green light gyrated wildly and toppled into emptiness.

Seated cross-legged on the huge golden globe that topped the palace, Bill Bradley waited for the dawn, his back to the rising sun. There was a rift in the uneasy clouds above him, and he began to hope for even more than he had dared expect before. The sleeping world was growing wanly lighter, the peculiar pearly dawn of cloud-wrapped Venus stealing over the city of Laxa and the imperial gardens.

A shaft of silvery notes thrust down from the troubled, racing clouds, brightened swiftly into liquid gold. Its tip sped out over the rolling roof of the jungle, pointing out isolated forest giants, open, grassy parks, splotches of color that were luxurious blossoms, blunt cones that had been volcanic vents. Like a colossal spotlight it leaped across the forests, on and on, out over the great bowl of the rock-walled peninsula where no man had ever gone and lived to tell the tale.

The man on the palace-top followed its course with his glasses. It was narrowing, growing paler and dimmer as the cloud-gap closed. He let his gaze rove a little over the surrounding jungle, but for the most part he kept his eyes glued to that racing shaft of light. Out, out, until it seemed lost in the blue distance—out to the very edge of the hills beneath Laxa—out to the unseen rim of the hidden swampland—shifting, shrinking, fading it went. An instant—it sank into a dip in the forest roof, then rose, wavered, and vanished. And in that instant its dying light struck up a burst of angry crimson from the cool green of the sleeping jungle!

An hour longer Bill Bradley squatted there, peering at the spot on the horizon where the sun-shaft had disappeared. There, somewhere, at the edge of the great miasmic swampland, there had been an instant's flare of burning crimson, the crimson of living flame. But the cloud-gap had closed, and in the pale light of the waking day the distant jungles merged in a sea of hazy grey-green, where not even his powerful glasses could distinguish form or color. So, with the sun an hour high, he went as he had come, down the crannied face of the palace, to a balcony and a window.

Noreena of Venus stirred in her sleep. Her dreams were disturbed by unpleasant, disquieting visions— a sleek, bearded face, a bursting globe of white fire, a giant orchid tongued with living flame. Through the dream crept the

sense of some presence, some watching mind. She opened her eyes.

The thick hangings before her window had not yet been drawn, for it was early morning. Yet they were not as she remembered them, as they had been at night. There was a gap where pale light filtered through. Something moved in the shadows beside the bed. She sat up, reaching for the bell.

A form loomed against the gleam. A hand took hers, a finger was pressed against her lips. The man knelt.

"Hush," he whispered. "It's Bill, Noreena."

"Beel! What is it? Why are you here, now?" She drew away from him and raised herself against the pillows.

"Noreena," he said, "I'm going away for a little. I want to say goodbye."

"But Beel," she protested, "where are you going? Why do you go? Are you not happy here? Don't you like me any more?"

"You bet I do!" he grinned. "You just come here!" He demonstrated his affection. She required quite a bit of conversion. Her faith in Earthly fidelity had been shaken. But the sun was getting higher and the day lighter with every minute. He put her gently aside.

"Noreena, listen," he said. "I have to do this. It's what I'm here for—my duty to Earth and to you. There's something afoot that means danger and trouble for everybody, and I've got to run it down. If Atampa, or anybody, asks you where I am, you tell them I've gone to get you the Flame Orchid!"

He squeezed her hand and was gone. Alone, Noreena lay staring up at the shadowed ceiling. The Flame Orchid! What did he know, or guess? What would he do, and Atampa? She shuddered.

CHAPTER III

Into the Temple!

● Two days later found William Bradley, of New York and Laxa, deep in the untrodden jungles of the great western peninsula. At first the forest had been open, with huge, pillared trees like the columns of some great, green-roofed temple and little pools and grassy glades and slender brooks. Then, as the level of the land sank, the lower branches drooped lower still and the underbrush thickened and rose to meet them, while a tough lacing of vines and mosses wound over and around every trunk and twig. He had lost a good deal of time here—most of what he had gained in the open woodland—by casting from side to side of the broad tongue of land on which he found himself, hunting for the trail that he knew must be there.

He found it purely by accident. His water was running low, and to replenish it he sought out the growing stream that bounded the ridge on the north. During thousands of years it had cut down through stratum after stratum of rock, forming narrow terraces that broke the sheer drop of the cliff. On the highest of these he found the trail.

He had ripped through the underbrush down to the stream and was on his way back to the summit of the ridge when he slipped and scuffed aside a great leaf-disc of a sort that carpeted the upper ledges. Under it was soft, moist soil, and a human footprint.

He edged along the narrow terrace parallel to the stream. A path of least resistance had been cunningly disentangled, close to the outer edge where the vines were thickest. No trail was evident, but a trail there was, and he saw to the charges of his ray-guns and set out grimly to follow it to its end.

It came sooner than he had expected. Perhaps ten miles of Earth measure from the place where he had found it, the trail came out on the wall of a rocky gorge, with the stream, now a brawling rivulet, chattering along three hundred feet below him and the roof of the forest as far overhead. This in turn opened into a broad, U-shaped valley, another hundred feet lower down. Each arm joined the reedy edge-waters of the great central swamps, and directly opposite, forming the solid center of the U, rose a mountain of crimson flame!

It was a hill, really—a volcanic cone some thousand feet in height with its base set in the murky waters of the marsh and its summit overtopping the surrounding forest. And for all of half its height, from its midpoint to its peak, it was blanketed with the riotous blooms of the Flame Orchid! Thousands, millions of the great flowers cascaded down its steep slope in one mighty sheet of flaming crimson, dappled with waving streamers of golden orange like little spurts of flame licking up from a heap of embers. And from that great mountain of blooms came a faint, sickly sweet fragrance that he had not noticed in the single bloom, filling his lungs with a deadening drug, soothing him, lulling his senses, numbing his mind.

Numbed or not, Bill Bradley's brain was a match for most of the situations that he met or that met him. He had heard plenty about the perfumes of Venusian flowers, and he had come prepared. In a little filigree ball that hung from a fine, strong chain about his neck he placed a bulb of the powerful Martian garlic and bore down on the tiny screw that started the pungent juices flowing down his shirt-front. In a trice his head cleared and with smarting eyes he began his long climb down the face of the cliff.

His game arm was stiff and ached, and it had a nasty habit of going numb at unexpected moments. Probably the needle of energy had nicked some important nerve. Twice it failed and nearly threw him off balance, but both times he managed to recover his hold and rest until the spasm of paralysis had passed.

That descent took him half a day. The last two hundred feet were sheer drop with only a tough net of slender vines to hold his weight. Several times they tore away from the rock, and he saw that the face of the cliff had been smoothed and carved in low relief, by the ancients, perhaps. He could not quite make out the significance of the sculptured fragments that he saw, and he was in no mood for art-study. His goal, and his danger, was right next door.

With the cliff what it was, he was not particularly surprised to find a crumbling quay running along its base close to the water-level. None the less, he took three long, incredulous looks before the significance of it clicked into position in his brain. The U-shaped channel was a man-made moat. And the hill of the Flame Orchids was a vast temple!

He crouched against the wall, considering the possibilities of the situation. If it were not deserted—and the

hidden trail spoke against the idea—he would probably be dealing with priests and religious fanatics. The Service generally kept its fingers out of religious pies. One of the first laws of space is "ignore thy neighbor's creed." Missionaries are forbidden by interplanetary agreement. Then his arm went dead again, and he remembered that methodical, cold-blooded pumping of energy at him, three and three and three, across and back and up and down, cutting the air of his hideout to ribbons. His lips set grimly. He was on "vacation" and he'd play the game as he saw fit!

Presumably there was a signal system somewhere, and a boat of some kind. Bill had no truck with boats or signals. He went quietly and alone. He made sure that his pouches were water-tight and at the same time easy to get at. Then, choosing a spot where the tangled vegetation of the swamp-infested moat seemed thinnest, he slipped into the water and struck out for the other side.

Luck was with him. He had chosen the very place that had been cunningly cleared to offer a passage for the ferry. The tangled stalks of the water-weeds were cut and loosened, and where great, horny reeds grew a narrow lane had been cleared through their midst. Once his arm weakened, and he sensed the beginning of a cramp shooting down his side. Furiously he plowed into the thick water, forcing the numbing muscles to respond, driving them into action, and after a long moment of sheer torture he felt them waking, responding, doing his will again. Drenched with thin slime, gasping for breath, he dragged himself over the edge of the quay and huddled in an exhausted heap against the wall. He was on the island!

● Dully he stared up at the sheer walls above him. They were fretted with a delicate floral filigree, the great orchids, repeated over and over again, their fine filaments rising in a thousand little spires of flame from a nest of twining tendrils. And above them, lipping over the edge of the wall, cascading down from the summit of the great cone, was the mad profusion of the flame-flowers.

Even above the reek of the garlic and the swamp their cloying perfume dazed and sickened him—seemed to steal away the keenness of his mind and senses, to open the dream-gate of some weirdly beautiful Paradise where soft music played and there were women, tall and lithe and glorious, like—like Noreena.

Noreena! Her voice seemed to pierce the mists that enfolded him. Her face, grave and pleading as he had last seen it, swam before him. Her mind seemed to speak from behind those glorious eyes, to command him, to draw him back from his world of luring dreams. Drunkenly he fumbled in the bosom of his shirt and drew out a little metal box. Leaden fingers found the catch, opened it, drew out a tiny crystal bulb. He bent his head over it and with an effort burst it between finger and thumb. In an instant his brain had cleared as the powerful fumes of the ammonia surged through his head. He stared about him sheepishly, at the moat, at the walls with their crest of crimson froth, at the tiny gashes in his finger-tip. Gosh! It had been a pretty near thing! He'd have to be careful.

He rose to his feet and started off down the narrow ledge, toward the right—the north. There was no scaling that sheer wall above him. Somewhere there must be, there would have to be, a door. And he was going to find it.

The fumes of the ammonia were beginning to dissipate and he mechanically reached for another capsule, wondering dully how long his supply would last. It wouldn't hurt to see how long he could buck that drugged fragrance, and conserve his ammonia. He shook his head violently to clear it and took a couple of deep breaths, then leaned against the wall to wait.

Five minutes passed, ten, and nothing happened. His mind was clear as a bell, cold and impersonal and utterly keen. His thinking-power was—well, he never *had* been so clear and clean of mind. It was wonderful!

It didn't take him very long to work out the truth of it. Like many drugs, this perfume was both a narcotic and a stimulant. First it befuddled the senses, and then, apparently, it cleared them. Or maybe it was the ammonia—the sudden waking from the drugged sleep, with both his waking faculties and the uncanny powers of the drug focused on his center of attention.

Those dreams—they had been unusually real and vivid. His subconscious mind had been working to capacity. And now that he had been snatched out of his trance, both conscious and subconscious intellects were concentrated on the same thing, giving an extremely keen, clear impression.

He tested his theory. He called up memory pictures—Zara, Noreena, the palace, Earth, New York. Wonderfully sharp and detailed they were, well-nigh perfect. He tried the other side—his conscious reasoning power, his awareness. That too was marvelously sharpened. There didn't seem to be a half-quantum of uncertainty in his whole mental makeup.

He turned his attention to the perfume of the orchids. Orchids didn't usually have perfume, he mused, not even here on Venus. Must be some reason for it. It didn't affect him as it had—didn't mean the same to him. It was just an odor, sweet, rather spicy, and just a little sickening, like ether. He didn't mind it though—in fact, he rather liked it. A hark-back to his dope dreams, he supposed. Well, he had no call to be dawdling away valuable time like this. He set out on his tour of the island.

He found the gate he had been looking for, around on the swamp side. From all appearances, the morass that choked the heart of the great peninsula had in ancient times been a huge lake or inland sea, and good-sized ships had come to the island temple. There was a ruined stone pier, and opposite it an alcove cut into the rock of the cone. Here the carving was truly riotous, and here traces of an ancient coloring still clung, protected from the storms, making the gloomy grotto live with the red-gold of smoldering flame-blooms, thrusting up in confusion from a maze of twining emerald. There were huge stone doors with shreds of gold leaf clinging to them, and high up in the gloom of the vault a little oval opening.

To be on the safe side, he tried the gates. No luck. They were barred on the inside. Bill grinned. Most temples, all over the system, were easier to get out of than into. He sensed something queer about the doors, and acting on impulse he reared up and gave them a terrific kick. It was with the greatest satisfaction that he heard

the boom of concealed steel armor-plate. This place wasn't half as old as it made out to be.

The doors were impregnable. So were the outer walls, as far as he was concerned. Here in the alcove though, the relief was deeper cut and little weathered, and fifty feet above his head was a hole in the bulwarks of this mysterious religion, plenty big enough to admit a man. He decided to be that man.

Compared to this, his one-armed scrambled down the cliff had been a picnic. Everything was beautifully smoothed and rounded, and nowhere was the carving more than three inches up. Luckily, his arm seemed to have recovered from its fits of numbness and he had two reliable hands with which to cling to the crumbling stone. Even two hands can be pitifully inadequate at times. Of one thing he was certain. Once up, there was no backing down, save by the uninviting process of diving. His bridges were spontaneously combustible.

Like some great drab bat, clawing and snatching and panting, he pulled himself up the sheer face of the niche and with a last spasmodic heave dragged his legs into the black, stinking hole that opened there in the shadow of the vault. It stank to high heaven, of damp and rot, and of the foul conglomeration of stenches that means dungeon on any planet. The thing was a ventilator shaft. Doubtless there were others, better hidden. He hoped that one of them might lead out, instead of in, by some less impassable route.

At least, it led in the right direction. On hands and knees, his body blocking out what little light filtered in from outside, Bill crept silently toward the heart of the temple. Yard after yard he edged his way into the stifling, reeking darkness, going warily, feeling his way gingerly along. And then, in the pitch blackness in front of him, there came a glimmer of light.

● Like some great, slinking rat he glided along the tunnel to where a narrow, barred slot opened in the floor. Lying at full length in the muck, he peered through. Only by a heroic effort did he keep from bursting into a strangled fit of coughing.

He was looking into a little high-walled cell, one of the temple dungeons—*oubliettes*, they used to call them on Earth. A cadaverous Venusian, holding some chemical torch over his head, was bending over the single narrow ledge of stone that served as a bed. There was a man lying there, gaunt and ragged. The stooping Venusian straightened up, and Bill bit his lip to check his cry of astonishment. The unconscious man was an Earthman—one of the Patrol!

Bill's eyes fairly bulged out as he stared into that little rock-hewn cell. The prisoner was stretched out on his stone shelf, dead to the world, and in a shallow niche just above his face was a golden chalice of the flame-flowers!

Strange contrast—that delicate vase with its vivid contents in this filthy hole in the rock! The great blooms, smaller only than the one Atampa had had, nodded eagerly above the drawn face of the sleeping man, their filaments swaying gently in some unfelt breeze, pouring their deadly fragrance over him. Bill smelled it, mingled with the foul fetor of the cell, stealing in perfumed waves through the heavy air.

The Venusian had been replacing them—the blooms of other days lay rotting in the mire of the floor. With a last look and a leer of savage satisfaction, the jailer went out, leaving the cell in darkness. In a few seconds there came a second shaft of dim light, from a cell ten feet further along the corridor. After a moment's hesitation, Bill crept on toward it.

There were twenty of those narrow cells, and in fifteen of them men of the Patrol lay in drugged sleep under the avidly swaying flame-flowers. For they did sway—they moved of their own free will and volition, with a sort of hellish glee of their own. It was no breeze that stirred their nodding cups, but muscle-tissues. They were not tools, but allies.

Bill didn't find that very hard to comprehend. Orchids anywhere are a queer lot, many of them carnivorous. Here, it would seem, the presence of living food—the odor of it, probably—caused them to emit that intoxicating fragrance, and when the prey was of edible size, the orchids feasted.

What worried him was the fate of those fifteen captives. Why were they kept in a stupor? Why were the deadly blooms renewed so carefully? For what purpose were they being held here in this forgotten temple? Was it—for sacrifice? At least he could give them a fighting chance.

He fumbled in his pocket and counted over the little ammonia capsules. There had been twenty. Two he had used and one was broken. Enough and two to spare, if things went well. The blonde Venusians would have to fare for themselves.

Beside fifteen slits in the stone he halted, thrust his arm as far as it would go into the room beneath, and hurled his little capsule at the sleeper's head. Let 'em chance glass-cuts! He had none to waste. With a grunt of satisfaction he heard the first man moan and stir, and after ages leap to his feet in horror and bewilderment. Into fifteen cells, to fifteen trapped men from his own planet, he whispered the same message:

"I'm Bradley, of the Patrol. I'm going to help you out of this if I possibly can. I'll be back after I get the lay of the land, and tell you how things look to me. Meanwhile you lay low and do a little tall thinking. We'll need it! Get me?"

And fifteen tense voices answered "Yes!"

Bill reconnoitered. The air-shaft that he was in, after it passed over the block of cells, went somewhere and he went along. Here and there it branched, but he stuck to the main shaft and crept slowly and carefully into the dark. And after about twenty minutes he saw a blue glow in the distance.

He went on his belly now, like a snake. He was a snake, ready to spit sure death at whoever had trapped those fifteen men.

The shaft broadened and opened into a sizeable niche high up in the wall of a great, echoing hall in the heart of the hill. Down over the face of the niche cascaded a veritable Niagara of the poisoned blossoms of the flame-flower, while from far below came a thunderous rumble and the murmur of voices. Rising cautiously to his feet, he peered through the net of tendrils.

Never in all his young life had he seen such a sight! The center of the island was one great cylindrical volcanic throat, carved by ancient men into the sanctuary of the giant orchids. It was open to the sullen sky, and

over its circular rim tumbled huge sheets and nets of the crimson orchids, hanging in long festoons and tasseled draperies clear to the polished ebon floor. They were far larger than those of the cells, every bit of three feet across. with streamers of flame-hue nearly twice as long. The whole surface of the shaft seemed to be alive with leaping, swaying, thrusting tongues of gold and crimson flame.

From circular pits in the temple floor spouted fifteen thundering shafts of vivid sapphire fire, huge jets of natural gases, impregnated with some metallic salt. Between them lanes on crimson marble led from curtained portals to a huge bowl of beaten gold at the center of the temple, within the ring of flame. And in the giant cup lay a thing that brought the watcher's breath to his lips with a shuddering gasp!

It was an orchid—one of the flame-flowers. It was twenty sheer feet across its gold-flecked maw, and the twisting streamers of gold and orange and crimson that shot up from around its tattered edges rose every bit of fifty feet into the still air. Its great mottled lip was like an altar of crimson marble, dappled with golden fire. And in its heart of angry scarlet a maze of writhing yellow tendrils stirred lazily.

CHAPTER IV

The Sacrifice

● Slowly his mind took it all in. This giant blossom—it was the evil deity of this evil temple. From it ran thick green cables like giant tentacles, out between the pillars of fire to the walls of the sanctuary, where they split into thousands of tiny ropes, covering the stone with an emerald net from which sprang the lesser blooms and those that covered the outer slope with their flaming blanket.

All of them—all the millions of them that grew over all this mountain-temple—were part of the single monstrous plant whose body or brain or whatever it might be lay here in its golden cup, basking in the sapphire light of the fifteen shafts of roaring flame.

It drank in that light, rejoicing, reflecting only the red and yellow of its flame-hued body. But for the dim white light from the open roof, it would have been jet-black, for the shafts were utterly blue. And it had no perfume. None of the blossoms that hung here in the blue-lit pit of the sanctuary, drinking in the rich color of the fifteen flames, had the seductive fragrance of those on the outer wall—those that must subsist on the puny light of the cloud-hidden sun, and what food they might lure with their drugged perfume.

It had been one of these blooms of the inner chamber, flecked with human, Earthly blood, that Atampa had offered to Noreena. He recalled her words—"He dabbles in science and religion." Had he been right after all? Was it Atampa who was behind that attack at the palace, who had provided some unnamed fate for the fifteen human wretches in the cells? Who—what was he? Was he the priest of the Flame Orchid?

Something was plucking at his sleeve. He stared down—started back in horror. One of the great flowers had closed over his arm like a crimson leech, and from beneath it crept ten little tentacles, toothed wickedly at their delicate tips, that were boring eagerly into the veins of his arm!

With a hoarse cry he tore loose. These too, for all their feeding flame, had the blood-lust in them. When had they fed last? *When would they feed again?* He must get back—warn the prisoned men—work out some plan of escape. He turned to scramble into the tunnel when from the sanctuary came the brazen muttering of an enormous gong.

He stopped short. Where was his duty—with the unsuspecting men, or here, watching, learning what it was that threatened? His choice was swift. They were of the Patrol—they could care for themselves. He turned to the screen of vines again.

He dared not risk attack. These things—somehow they had communicated, realized his presence. They were groping for him with their evil little yellow fingers, fanning the humid air with their eager flaming streamers. They knew he was here, and they were hungry. Well, he'd give them something to think of! He drew his knife and crept toward the front of the niche. He'd learned to use it in space, where a knife is as deadly as a ray. But never had he fought a duel so utterly weird as this.

The things were uncannily quick. He dared not sever the giant blossoms lest he be seen from below. In their avid tentacles lay their menace, and with his knife held ready he set out to sever those writhing clusters of slow death.

They had some sense of his nearness and were reaching for him, their very stems, long and slender like worms, bending and stretching in his direction. Like lightning he struck, twice, and two little clumps of yellow tendrils lay twisting at his feet—two great, mutilated blossoms, dripping thin red liquid, were whipped back out of reach. A sort of shudder ran over the whole net of vines, and the untouched blooms withdrew a little, then came groping blindly forward again. He stabbed—the flower whipped out of his way and a second fastened on his wrist with the speed of a striking snake. He slashed out at it, severing it from its naked green stem, and trampled on its evilly stirring form. Things went redly hazy around him. He struck out frenziedly, slashing at vines, flowers, anything in his mad rage. And suddenly he saw that the great orchid at the center of the temple was stirring too, uneasily, as if disturbed.

His whirling brain cleared. He saw the thing he had done. Blind mad, he had slashed and torn with unleashed fury at the hungry, groping flowers, the flowers that were the body, the outer husk of the giant plant whose vital center was in that monster bloom in the golden cup. *It* felt the agony of his knife, not they. *It* was fighting him, at first idly, as one might avoid a thorn or a gnat, then with growing, waking recognition of his menace. The thing *knew* that he was there, that he was hostile and dangerous, and it would fight in deadly earnest!

The temple was filled with a growing restlessness—the giant orchid heaving in its cup of gold, its lesser members waving their tentacles and fumbling eagerly in his direction. The priests saw it too, and as he crouched behind the tattered remnant of his screen Bill saw them rush out over the floor toward the master bloom, saw them crowd about it, puzzled, *questioning it!* And in an instant of horror he knew that in some awful way it would answer them!

Somewhere that great gong crashed again. The priests hesitated. Again came its brazen thunder, and from the depths of the temple-mountain came the sound of chanting. They scattered to their posts beside the curtained portals. As they stiffened in their places a strange procession entered through the great arch just beneath him and halted ceremoniously.

The orchids seemed oddly intent, rapt. They ignored him—forgot him in their eager anticipation. Cautiously he bent forward and peered down into the sanctuary. He was right! It was Atampa!

Like some huge moth he was, with his great flaring cape of scarlet silk, barred and lined with black. Scarlet and black were his other garments, and on his pale forehead smoldered a great ruby. A moth—Bill smiled grimly. More like Earth's Satan he was, with his pointed beard and evil, burning eyes!

Out into the middle of the temple strode Atampa, high priest of the Flame Flower. Behind him came others, half a hundred of them, spreading out in concentric rings beyond the circle of the flame shafts. Within that circle were only Atampa and six others—the highest in the service of the giant orchid. Like him, they were garbed in capes of red and black, like him they bore great rubies on their foreheads, but none could approach him in savage splendor.

From under his cloak Atampa drew a little disc of beaten silver, hung on a twisted thread of gold. He rapped it sharply, and every head snapped erect as the tinkling note sang through the great temple and ran laughing down the corridors. There was silence, broken only by the rasp and rustle of the avid blossoms—then there sounded an answering note, low and golden, and into the sanctuary strode a strange trio.

First, head in air, glided a woman. She was a flame of scarlet—scarlet of jewel-blood, scarlet of desert sunset, scarlet of sun-flame—and her face was hidden by a sweeping veil of gossamer black. Proud, graceful, beautiful beyond all doubt, here was a woman to make man gasp! There are many such on Venus.

Behind her towered two naked giants—utterly hairless, utterly huge. Great muscles rippled under pendulous lobes of thick fat. Their vacant beady eyes were sunk under protruding ridges of bone. Their naked skulls were peaked. And their skin was scaly and deathly white. Imbeciles they were, cretins, lower than the lowest beast. And they bore scimitars of blued steel, and golden chains that ran to the woman's wrists.

Sardonically Atampa waited before the chalice of the great orchid. Utterly unafraid the woman strode down the crimson aisle between the glowering ranks of priests, between the sapphire shafts, into the holy circle. At the circle of the flames her warders halted. No common man might pass that gate of fire. Rudely she was jerked to a standstill, but no cry or gesture escaped her. And Atampa seemed to approve.

Chuckling malignantly to himself he came forward, took one of the scimitars. With a single sweep he severed the two golden chains that bound her, dragging sharply at her wrists, searing the delicate skin. She made no sign, but stepped forward and stood beneath the great flower, a lithe flame every bit as avid as it. Sharply Atampa's hand came up, and the ritual of the Flame began.

From each corridor came a priest, wheeling an apparatus of prisms and lenses, with a great concave mirror of polished silver at the rear. They converged on the center of the temple, until each stood immediately before a sapphire pillar. Again the high priest's hand came up, and with a quick thrust they pushed each apparatus directly over the pit from which the flame-shaft sprung.

Out of those weird machines spread thin fans of pale blue fire, mingling above the paths to form a wall of flame with fifteen high-arched gates. Out of the inner face shot fifteen shafts of vivid sapphire luminescence, pure light, beating down upon the great orchid, bathing it in sheer glory, glutting it with energy. The flame-wall toppled slowly inward, forming a high-peaked dome above the golden chalice of the orchid-god, and as the pale light of the sky was blotted out the flaming orchid and the robes of its servants became coldly, evilly black.

Utterly strange that scene was to the man crouching behind his flower screen, high on the temple wall. The mosque of blue fire with its fifteen gates and its fifteen paths of crimson, dimming to glittering black—the half-seen shafts of light beating down on the basking flower-god and its golden altar—the silent black-clad shapes of evil within the holy of holies—to the followers of the dread deity the scene must have been alive with mystery and power! Bill saw only a brooding doom, creeping closer with every instant.

The silver disc chimed once. The priests leaped forward and as one man drew back their focusing machines. The fifteen sapphire pillars thundered upward as before. And in the center of the sanctuary the giant orchid was horribly alive and eager, its appetite aroused.

Again the silver chime. Fifteen haggard, blonde Venusians were brought in by their bestial warders. Filthy, emaciated, they stared boldly at the orchid and its priest, their lips curved by a cold, contemptuous smile. None seemed to see the woman beside the chalice, but her slim white hands, linked by a short golden chain, were tense and white-knuckled.

Smiling coldly, Atampa looked at the woman. He seemed to be waiting for a signal. None came. He turned with raised hand.

The strange machines plunged forward. An echoed click, and out of their rear faces darted pale white beams of fire, striking the bound men full in the face. Where heads had been were twisted cinders, and toppling bodies were caught by ready hands and hurled into the eager vine-net. A hundred little nests of tentacles seized upon them, bit into their veins, sucked hungrily at the rich red blood. Up along the face of the wall their limp corpses were borne, from group to group of the avid orchids, until, dry, lifeless husks, they were hurled to the ebon floor. There came the click of the machines, and they were drifting white ashes on the glowing stone.

Atampa stood with arms folded staring at the motionless woman. A statue she might have been, cut from enameled granite. No move, no sound betrayed the emotions that must torture her. With a snarl he tore the veil from her face. *Noreena!*

A cold smile curved her crimson lips, but her face was deathly white and her eyes blazed with the fury of the

sapphire shafts. Like marble she stood, staring at the little heaps of ash on the black floor.

Atampa's voice came purring out of the hush of the temple.

"Ashes, Noreena," he whispered, "white ashes. You sent them, Noreena—to die terribly before the altar of the Flame Flower, the flame-god, Taramantha. As its voice among men, I thank you, Noreena."

Her mouth was a fine red gash in her marble face. No misery burned in her eyes, but fury, cold and unrelenting. Atampa's voice raised in triumph.

"Look on the outlawed children of the Flame, Noreena! Look on its altar, and on *It*, if you dare, Noreena! Look—and remember!

"Remember the laws of the pale kings of Laxa: 'There shall be no worship of the Flame in the land of the kings of Laxa. Its temples shall be made ruin and its priests hunted with thlakas and slain to the last man. The Kings of Laxa are lords of the Universe!'

"Remember the old laws and the old tales, Noreena. Remember the curse of the dying servants of the Flame. 'O beardless Kings, await the Flower of the Flame!' Remember, Noreena! Taramantha is eager."

Goaded beyond endurance, Noreena spoke. Her voice was utterly cold, utterly contemptuous.

"Beast! Remember the old laws. Remember the thlakas of the Kings—their keen eyes, their savage beaks, their bloodied talons, wet with the vile blood of the black priests of the hell-bloom! There are yet thlakas, Atampa, and there will always be Kings in Laxa! Three planets will hunt you down if your filthy paws so much as touch me! Down—grovel before a Princess of Laxa!"

Like a great, maddened cat Atampa sprang. He seized her by the shoulder and hurled her spinning against the chalice of the orchid, leaped after her and with his clenched fist beat her to the ground. Straddling her inert form he screamed his command.

"Bring them in! Show her the power of the planets!"

Bill's instinctive leap was checked. Into the temple, bound with heavy golden chains, stumbling in drugged stupor, came the captive Earthmen. He had not warned them. They were doomed!

Before each sapphire shaft a man crumpled to the floor. Atampa's fury knew no bounds.

"Fools," he screamed, "why are they still drugged? What were my orders?"

A priest of the outer circle came humbly forward to the circle of flame-shafts. "Lord," he said, "they were given the blossoms only as you decreed. Yet when we came for them they were thus. There was a strange odor, and the blossoms were limp—"

"No lies!" cried the maddened priest. "You have disobeyed the voice of the Flame! Get out! And remember as the Flame will remember!"

He wheeled and dragged Noreena to her feet. Her eyes were closed, her lips pale. With brutal slaps he beat her into consciousness, then dropped her in a huddled heap against the base of the great golden bowl. A demon of red fury he towered over her.

"Look up, Noreena!" he jeered. "Look up at the beasts of the swampland. Look up at the outlawed servants of the Flame. O Princess, look up!"

Trembling with rage, she staggered to her feet and stood before him, clinging to the edge of the great chalice. Her eyes crept around the circle of inert forms, each beside its flame-shaft. Slowly she turned, her gaze following the circle. She stepped away from the bowl, her back to Atampa and the niche where Bill crouched. And then a miracle happened!

Against the far wall lay the great conclave mirror of one of the strange machines, of polished silver, very long of focus. Lit by the glare of the sapphire shafts, she tottered into line between it and the hidden niche, and in that instant it seized her image and hurled it, upside down, into the air, a hare ten feet before the startled man. With a leap he was at the screening vines, tearing them aside, and stood for a long moment staring into the eyes of the phantom before him. They widened. Her lips parted, then set. She saw him! He dropped back into the shelter of the niche as, drawing herself erect, she turned to Atampa.

"Who are these men?" she demanded.

"You should know, Noreena," sneered the priest. "For many weeks one of their kind has been your lover. By the old laws, of the Flame and of the Kings of Laxa, your life is forfeit. Bestiality brings death, Noreena, even to a Princess of the golden-haired Kings. And under the scourge of the Flame the space-beasts will be hunted down and slain to the last one, until no alien foot will dare touch the planet! Earth, Mars—by the Flame, they will fear the docile sheep of Venus before long! Every beast on the planet will die, and soon!"

"They were no beasts," she cried. "They are men—men of Earth. They are our cousins, our brothers. Three planets will blast you and your foul kind out of being if you dare touch them or me, Atampa. I swear it!"

"You think so, Princess?" he asked. "Look at those black rags, foul with filth. All is not dirt—that is the black of the Patrol, of the Service that cares nothing if its men are slain. They were sent here to die, Noreena, and if a fool had not drugged them you would watch them die. But you shall die first. You shall be judged! Are you ready, O Priests?"

Like the far mutter of thunder came the reply. "We are ready, Lord."

"Listen then, and judge according to the law of the Flame. She has hunted down the children of the Flame and put them to slow death. She has cast down its temples and destroyed its altars. She has cast it out into the swamps to rot unworshiped. She has blasphemed in its name before its altar. What says Taramantha?"

"It is death," came the dry whisper.

"Listen further, and judge by the laws of the Kings of Laxa, that no man may cry injustice. She has placed a beast above the high-born of the court. She has taken a beast for her lover. She has entered the temple of an outcast god and lain in worship before its altar. What say the Kings?"

"Death," soughed the voices of the priests.

"Do you hear, Noreena?" jeered the high priest. "You are of the blood of the blonde Kings. What will you say? Have we judged aright, as the law proclaims?"

"You know the truth, Atampa! I have no lover, beast nor man, though you have sought to force yourself upon me. This place is no temple, this basin no altar, and your weed no god! You will die, Atampa, soon and not pleasantly."

A shocked murmur ran through the watching throng. Sacrilege! Blasphemy! Hell-fire burned in Atampa's eyes. A swift stride and he had thrust her back against the golden chalice of the Flame Flower. A word, and two priests seized her and pinned her there, helpless. From under his robe the high priest drew a little instrument of three strings and a tiny bow, and began to play.

Cold chills ran up the spine of the watching man. Like the thin, far screech of some harpey was that wailing tune, shrill and tremulous, mounting higher and higher in a thrilling lament of utter hunger. The orchids began to tremble, to stir uneasily on their slender stems. And in its chalice the great Flame Flower of the black priests was stirring too.

Its filament wavered and swayed like tongues of golden, red-flecked fire. Its hungry yellow tentacles crept out over its evil lip. It rose above the rim of the bowl, revealing the long, pendulous pouch that hung from its underside, nested in darkly colored serrated leaves. From where he crouched, Bill stared down into the monster's blotched and speckled throat, into that drooping sac. In it quivered a mass of pale grey jelly, seamed like some gigantic brain. He stared at it dumbly. It was covered with a net of fine white filaments, twining together into little cords of white tissue that vanished into the body of the giant flower. By God, it *was* a brain! Leaping to his feet with a scream of warning he emptied his ray-gun into the pulsing mass.

CHAPTER V

Parting of the Ways

● At his shout, Noreena tore free from the two priests that held her and dove under the curve of the chalice. Petrified, Atampa stared at his tortured god. Its brain was not as ours. vital to life, for its life was not as ours. It was a plant, living as plants do. Yet it felt the exquisite agony of death as Bill's ray seared the delicate nervous tissue of its unnatural brain. Writhing in pain and fury it raised itself like a striking snake on its stubby stem. Its heavy head and flaming jaws thrust out and down.

Its whipping tentacles closed on the throats of Atampa and his two priests and snatched them kicking into the air. Immediately the saw-edged tips dug into their veins, and their hot blood dappled the outthrust lip of the giant Flame Flower as it dragged them struggling into its cavernous maw! For a moment it swayed with the violence of their death-writhing, then there came a horrible bubbling scream and the huge petals closed slowly over them.

Beside the sapphire shafts fifteen men of Earth sprang to their feet and leaped into the inner circle of the sanctuary. Noreena was on her feet, and as the four remaining priests rushed at her she drew from the bosom of her dress a tiny silver whistle and blew three sharp blasts.

The temple woke to the echo of racing feet. From every corridor plunged a score of royal guardsmen, armed with swords and rays. Caught between death and superstition, the lesser priests milled frenziedly about, then broke for the altar of their god. But in every gate stood a man of the Patrol, brandishing a blue-steel scimitar that was like a disk of lashing flame before them, biting through flesh and bone in awful mimicry of the fifteen sapphire shafts of death that framed them.

The four priests within the circle of flame had stopped at Noreena's signal, undecided whether to fight or flee. They had no choice. But, dying, they would take with them the defiler of their god! Again they had counted without Bill.

He had come down the wall like a great, agile ape, ripping through the waves of angry orchids that burst over him. Streaming blood from a dozen deep gashes he dropped into the mêlée on the temple floor and drove through it toward the altar and Noreena. He reached the edge of the milling throng, beating his way with the butt of his ray gun, and with a warning shout leaped into the open inner space, under the guard of one of the fifteen warders. Noreena was down, stunned, the four standing over her with faces and arms raised in supplication to their dishonored god. At his shout they turned, and he was at them.

It was a good fight while it lasted. They were all big men, and knew a number of the finer points of in-fighting. Without help he would have been swamped, but help arrived in the shape of a blood-spattered blonde Venusian brandishing a two-handed sword. One man went down like a stone, his head bounding merrily off over the floor. The sword bit through the upflung arm of a second and turned, to sink into his shoulder and stick. And the third man stepped under its swing and before the Venusian officer could free it was at his throat.

It was a fine fight, nothing barred. Priests and poets make efficient fighters, with a maximum of damage for a minimum of effort. Bill Bradley found himself with his arms wrapped around a baby cyclone, and he didn't dare let go to get another hold. The advantage was all with the other fellow.

Out of the welter of claws and fists and teeth which he had managed to fend off with a hard dexterous skull, he emerged to consider the situation. Desperately he toppled backward. The fellow's head missed the base of the chalice by inches and rammed into the floor. No effect. Yanking his knees up under him, Bill let go and kicked out.

What might have been a success was a fizzle. The priest went right on over, landing on both feet where Bill's face should have been. It wasn't. They were both up, and then Bill's heel skidded in the red pool that had gushed from the severed head of the first priest and he went down with a thud that put him temporarily out of the picture. The priest drew back one foot for the conclusive gesture, whereupon the other was snatched from under him and he came down on his face, hard. Noreena had entered the lists.

Bill Bradley came out of a dream of flames and cretins to find a pale-faced Venusian officer tugging at him and shouting in his ear. Noreena? She was here a minute ago. He pulled himself upon his elbow and rolled over. In a welter of red, the gold of her hair caught his eye.

He dragged her out from under the man who had been trying to kill him the moment before, and began to mop at her face with the remains of someone's cloak. No wounds, thank God. She'd just fainted. Whereupon she shivered and drew closer to him. Grinning, he let her drop.

● So it happened that Noreena, Princess of Laza, sat in judgment on the last of the black priests of Taramantha,

(*Continued on Page* 374)

(*Illustration by Paul*)

Parts of the Mediterranean had been flooded. Cities on the sea coast were becoming deserted and people preferred to live in caverns on higher land.

IN THE YEAR 8000

By OTFRID VON HANSTEIN

Translated from the German by
Laurence Manning and Konrad Schmidt

CHAPTER X

"Destroy Berlin!"

● A conference of the leading statesmen in Berlin, Paris and Mammoth Cave City was in session. The representatives of the various governments no longer had to assemble at one place. The German foreign minister sat in his soundproof room. His receiver and transmitter were on his forehead and he was thinking:

"Have you heard, gentlemen, that the 'New Chengis Khan' is on his way with a gigantic fleet to Timbuctoo?"

Abraham Linco, the American president, thought back:

"I have heard of it and I think we had better be on our guard."

● The stage in this story has been prepared for stirring events. Behind the scenes is brewing a terrible plot for the destruction of millions of unsuspecting people. Grando Blanco, capable engineer, works upon an epic-making project, the emotionless world of the year 8000 moves onward to greater accomplishments or towards destruction.

Herr Hanstein suspects that some of the great events of history occur from causes that science cannot explain. He calls them Fate or Destiny, and in this installment we will see how those forces effect the lives of our characters. We will see further, how a purely scientific people of the year 8000 adjusts itself to the great tragedies that it must face.

WHAT HAS GONE BEFORE

In the year 8000 all of the cities of the earth except Berlin are underground, due to destructive downpours of meteors that strike the earth. The people are emotionless, and are either mechanical breeders of children or workers. Emotion has been forgotten. Grando Blanco a young engineer is engaged in driving a shaft deep into the earth to be used for transportation between continents. His cousin Bela Wilson is secretly in love with him. Bela must choose between being a Mother or a Knabina worker. Being a throwback to a more emotional age, she wants love. Her uncle gives her work supervising a mechanical farm uninhabited by any other human beings, and here Bela is frightened by the mechanical monsters that she must deal with.

Meanwhile there is bad blood between the Blanco, or white race and the Nigro, or black race and the Asiatics. Sam Bell, a negro employed by the whites, comes to the emperor of Africa and promises to overthrow the whites. During a meteor fall over Berlin he will discontinue the current that raises a protective barrier over the city and allow millions to go to their death.

Near Berlin, in a cave, is a Doctor Werner, who still believes in the importance of emotions in human life. He has been engaged in transplanting limbs and organs from destroyed human bodies, and so making new bodies.

Bela, forced to choose a permanent occupation, becomes an assistant to Grando Blanco, and is employed on a great tunnel that Blanco is building between Europe and North America. She meets Will Gernhold, a sentimental assistant of Dr. Werner, and Gernhold falls in love with her.

Grando goes down into the tunnel shaft with Bela to investigate some curious phenomena, and they are trapped. After some narrow escapes from death during which Bela proves herself to Grando, they are rescued by Dr. Werner.

When the fall of meteors occurs over Berlin, Sam Bell is caught trying to destroy the meteor shield and is returned to Africa where the black emperor kills him. Africa and Asia now drop their mutual hostility to prepare for a concerted attack upon Europe.

The Parisian minister put in, with his usual ironic manner:

"Let us permit them to waste their strength on each other. The harder they fight, the safer we become."

* * *

The great tunnel of Grando Blanco had progressed very rapidly. They had now penetrated through to the liquid core of the earth. The temperature in the shaft had risen far above human endurance. In spite of lining the shaft with refrigerating apparatus and forcing cold air continually through it, it would have been impossible to proceed further had it not been for the inventor, Bob Woodrow. He had perfected an insulating material which gave complete protection from the heat—just as the suits worn by space navigators protected them from the cold of space. It was formed of asbestos-like fibre and underwent no change even in the heat of a blazing fire and was so effective that anyone enclosed in it felt no heat except that produced by his own body.

Grando Blanco and Ben Vintros were descending to the bottom of the shaft. They wore insulated diving helmets, with oxygen apparatus attached, to which they were already accustomed. They carried electric searchlights, connected to long, insulated cables. The shaft had now been driven 1,250 miles deep. Electric substations had been set up inside—galleries blasted into the rock every thirty miles down. The radium power generators had been moved down from time to time as the work progressed. These operated the derricks and cutting tools. The workers required at the lower depths worked in diving helmets and insulated suits, like damned souls in a scientific Hell.

Blanco and Vintros had reached the lowest gallery. The walls had the appearance of warm asphalt. Below them the shaft extended through softer and softer stone, until far below appeared a pool of what looked like molten metal. They stood for a long time in silent thought. Even these men, trained to show no emotion, looked with some awe into depths never before seen by mortal eyes. Without a word they completed their inspection and ascended again the hundreds of miles to the surface. They entered the construction building.

"From now on it will be easier, Vintros. I think we can stop the cutting machines. We will just build the caissons of Woodrow metal and sink them into the earth, sucking out the hot lava with pumps. Please have the chemical laboratories carefully examine this lava as it comes up. We may come upon valuable and unknown metallic compounds. They would presumably be extremely heavy metals which sank to the center when the globe was still liquid."

"That has already been arranged."

Grando rubbed his hands.

"One half of our task—the more difficult half, at that—is completed."

A bell rang and at the same time writing appeared on an opaque glass plate set in the wall.

"URGENT RADIO MESSAGE FROM AMERICA."

Grando took up the receiver.

"Shaft completed a few hours ago down to 1,200 miles," he read. "We hit a semi-solid transitional zone. Signed, Dan Collin."

Grando was able to return almost exactly the same report of his own shaft to America. Then he reclined comfortably in his chair.

"There's nothing like accurate calculation and careful work. Vintros, would you be so kind as to report to the president of our company who has arrived this morning and is staying at the Caravanserai? As for myself," he continued, "I think I will snatch a few hours' sleep and get back on the job at noon. We will have to rearrange the entire machinery. Have all the laborers stop their machines and come up to the surface. Let's declare a half day extra holiday—they have honestly earned it."

Grando Blanco stretched out on his couch and was instantly asleep.

Vintros, who had been off duty the night before, went out to issue the new orders. He watched while the last of the men reached the top of the shaft. They looked like some prehistoric monsters in their unwieldly suits and helmets.

As they stripped these off their bodies they all breathed deeply and zestfully of the pure mountain air. Then Vintros walked slowly towards the hotel where the president of the company had taken quarters. He looked up to the cloudless sky. What a glorious day it was! How motionless lay the leaves of the trees! On the top of the mountain was the observatory in charge of his sister Edith. What an easy job that must be, high up above the sweat and grime of the workaday world! What had a meteorologist to worry about on such a clear day as this? He entered the log building which served as hotel to the construction camp.

The president congratulated him on his satisfactory report.

The atmosphere was tense in the great observatory on the Brocken Mountain. Edith Vintros had not left the telescope the entire night. She was in charge of the observatory. Many women occupied such scientific posts, more so than men who, as the population became gradually reduced, took more and more to technical and engineering occupations.

Alarming news had come from her old observatory on the Moon. An unusually large quantity of cosmic rocks were racing through the solar system. Was the Earth their goal? Or would they be deflected at the last moment? Even if they missed striking the Earth, might not the wind of their passing in the outskirts of the atmosphere cause violent hurricanes and perhaps lay waste great sections of country? Ellen Mors, the assisting astronomer, looked up from her telescope. It was her duty to keep an eye on the traffic of the stratosphere. Of course, her own telescope showed only a limited portion of this, but all the other observatories were in television communication and she could observe their fields of vision on opaque glass screens beside her.

"The entire traffic is suspended. The warning signals have been understood everywhere."

● Edith's forehead wrinkled. "If only Grando Blanco's shaft and tunnel were already completed . . . ! These continual suspensions of traffic will ruin our commerce if they keep up. Why, it takes more than an entire day to travel from America to Europe, with the interruptions we have been having lately!"

Ellen Morse could not repress a cry.

"Look! Quick! The entire airfleet of the Yellows is over north Africa! They cannot have heeded our warning. They are probably loaded with poison gas."

"On their way to the destruction of Timbuctoo, most likely."

"What does it matter to us! If meteors destroy the fleet, perhaps it will be just as well for us."

Edith Vintros laughed. "It remains to be seen whether Bhudda, god of Asia, or Allah of the Mohammedans will be the mightier. Something is bound to be destroyed tonight—either Timbuctoo or the Yellow fleet."

Edith, for Heaven's sake!"

"What is it?"

"The entire fleet is heading north and has already begun to cross the Mediterranean!"

"What can be the meaning of that?"

"Perhaps storms are already raging over Africa. They are not rocket ships, but look like heavily-loaded freight vessels."

"Hurry! Radio to Paris, Berlin and all European stations!

"WARNING: CHINESE AIR FLEET APPROACHING EUROPE."

"See them travel! They must be going full speed."

"Well, they are simply driven forward by the storm."

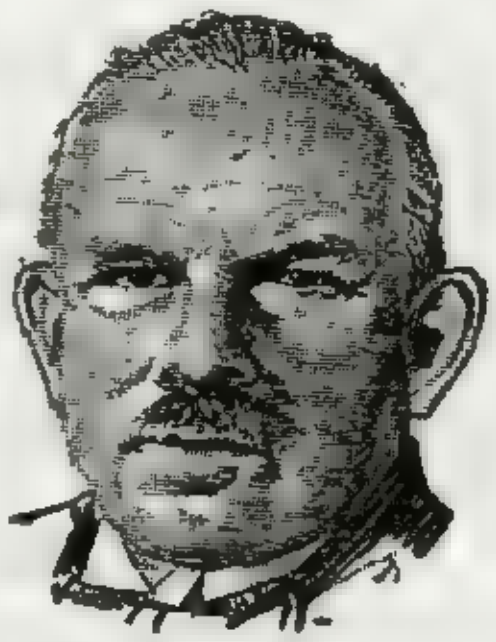
Her words became stuck in her throat. Complete darkness fell, although it was almost midday.

"S O S METEORS IN SIGHT."

Within the next few seconds a great deal happened. A terrific gale sprang up, howling in the mountains. A moment before the air had been perfectly calm. Not a leaf was stirring. Now the crowns of the aged trees were lashing in fury and patriarchs of the forest were torn up

by the roots and cast like splinters to the ground. The hurricane raged around the massive rotunda of the observatory. The precious telescope—the largest in Europe—was badly damaged. Some of the instruments were torn off and carried miles away. The heavy windows of steel-rimmed glass yielded and shattered on the floor. The Knabinas were hurled against the wall of the building, scarcely able to breathe. They held their hands in front of their faces. The air became icy. Great flashes of lightning came and terrific thunderclaps were heard, for the great friction of the atmosphere caused extreme electric disturbance.

A second later an enormous flood of sound beat on their ears—as though the entire world were collapsing. The girls kneeled on the floor—almost unconscious. Great pieces of stone and rock hurtled past the observatory from the valley below. The dome of the structure was bombarded as some of them fell on it. It was impossible to know what was going on, even if one could retain one's senses, for everything was shrouded in velvety blackness. Only one thing everyone realized: The cosmic stone was falling on them.



Otfrid Von Hanstein

A huge block weighing hundreds of tons had burst through the rock roof of Hermann's cave below. It had been shattered into several enormous pieces and one of these had happened to fall down the great shaft. Racing down with immense momentum, it created enormous pressure and heat in the shaft. The stone core of the meteoric mass was hurled back with inconceivable force, as from the mouth of a giant cannon, and burst red-hot back to the surface, through the atmosphere, and out again into space whence it had come.

A moment later something else occurred. Some of the meteors reached well down into the shaft and some even touched the glowing lava at the very bottom. The result was a Gargantuan explosion—just as thousands of years ago occurred when the ocean came in contact with the lava at Krakatoa. A volcanic eruption occurred immediately. The masses of stone hurled up were of great size. A violent fountain of lava shot up through the roof of the cave as high as the Brocken mountain, while from the mouth of the cave a great stream of molten stone poured down over the roads and buildings. In a moment the workmen's lodgings were ablaze. The forest was already burning—the sap in the trees dying instantly in the terrific heat. The machines near the cave-mouth extended white hot arms into the air for a moment and then collapsed into shapeless masses.

Everyone had been warned, however, and had time to escape. As fast as their feet could carry them, they panted forward in the stifling heat. Some had fallen from exhaustion when the terrific air pressure lessened. As quickly as it had come the hurricane had ceased. The sun shone brightly once more, but not over the district of the Hartz Mountains, for the new volcano sent up a huge black column of smoke and steam. It grew like a gigantic mushroom and darkened the sun completely.

Hang Cho Fu's fleet, consisting of four hundred heavy freight airships, had appeared on the African Coast the night before, according to agreement. The admiral's flagship floated for an hour over the island of Zanzibar. The Emperor Mosilihortse had boarded her from a small airplane. He was received by the Emperor Hang Cho Fu. They wished to observe together the great spectacle of Europe's destruction. They sat opposite each other. Their faces were hard and cruel in anticipation of their great vengeance on the hated White race.

"First, to Berlin! Destroy Berlin and you have stabbed the heart of Europe."

The ships proceeded at comparatively slow speed, for they were heavily loaded with poison gas. When morning dawned they were over North Africa. It was the hour when the observatory had first sounded its warnings over Europe. At noon they were crossing the Mediterranean.

"It will be night before we reach Berlin."

Then quite suddenly they were in the midst of a storm, which whirled them northward. Darkness fell over everything and the ships drove on at a velocity no rocket plane had attained in the atmosphere, which howled and shrieked about them. Now they were across the Alps; now over Germany! A sudden and terrific pressure of air threw them eastward at terrific velocity for a few minutes. This coincided with the impact of the meteoric matter near the Brocken mountain. Then the air rushed forcefully back westward, hurling with it the violently tumbling airships—now quite out of control. And . . .

As the fleet of gas-laden ships was drawn by the unimaginable suction of the air directly over the point where the fall of meteors had occurred, the volcano burst beneath them. With the roaring crash of the volcanic explosion there mingled the death cry of four hundred war vessels. The ships were burst and shattered, but the death-dealing gas could not sink to the earth in that violent commotion. It was whirled off into space or distributed innocuously throughout the upper atmosphere.

Europe was safe once more. The unbelievable coincidence—or was it more than that?—had taken a weapon from outermost space to destroy the murderer as he swooped down over his victim. Somewhere in the mountains of dust and ashes which had settled over Germany were buried the bodies of Hang Cho Fu, Emperor of Asia, and Mosilihortse, ruler of Africa. They had found their graves in the very land they had come to destroy.

● The weird spectacle of the new volcano had lasted a day and a night. Courageous men who had ventured to the Bielstein, a mountain close by the Brocken, where the smoking ruins indicated a former pavilion, saw a gruesome sight. From the roof of Hermann's Cave, now a yawning crater, smoke and steam lazily arose. The forests on the mountain side were almost completely destroyed and lay in chaos. The valley was a lake of brown lava. The streams of thick mud extended along

the roads leading to nearby towns. Lava still flowed from the mouth of Hermann's Cave. But it was a mere trickle compared to what had formerly poured forth.

With staring, horrified eyes, the people who had been saved by the timely warning sat on the slopes above and looked down on their former homes. Airships were circling overhead, ready to bring relief to the stricken community.

As the day wore on, the smoke decreased. Ben Vintros ventured with a group of resolute men into Hermann's Cave. With ropes and ladders used as bridges, it was possible to scramble close to the mouth of the shaft without touching the still molten floor. The opening yawned black and ghostlike before them and with gas-masks over their heads they bent over the edge, from which poisonous vapors were still escaping.

Vintros had brought along an insulated glass globe containing a powerful electric bulb and a small battery. On a long cable he lowered this luminous sphere down into the shaft and let it fall. The light dropped deeper and deeper and finally became so small a spark, far below, that it could no longer be seen. Not a sound could be heard, although the globe had been filled with explosive gas which would have caused a sharp detonation had it struck bottom. But everything remained dark and silent in the depths.

Vintros straightened up.

"It almost seems as though the subterranean powers which we freed against our own will had been of assistance after all. The lava we wished to suck up laboriously with pumps had been expelled for us—and a thorough job, at that! If the explosive gases are really expelled and the artificial volcano really silenced, it is possible that our task has been furthered by hundreds of miles."

"But the lava, which must be under great pressure, will have flowed together again down there."

"It will be our task to determine that point as soon as the interior has become sufficiently quiet to permit our going down into the depths. All our machinery, of course, including the elevators, the generators and the galleries, is completely destroyed."

They climbed back out of the cave once more.

"But Grando Blanco is no longer alive. He was on his way to the shaft when the eruption occurred. If the sudden shock of the meteoric matter did not kill him, he can hardly have escaped the burst of lava. Well, he fell on the field of honor amidst the gigantic operations he was striving to complete."

He suddenly noticed beside him the grey figure of the President of Germany. He had come by rocket plane from Berlin.

"He has died a true hero! He has saved his country and probably the entire white population of Europe, although he did not realize it. The war fleet of the Yellows was coming to destroy us with its gas-bombs. It has been shattered and completely wiped out in the sudden eruption. Hang Cho Fu, the Emperor of the Flavo, who was conducting the great attack in person, was on board one of the ships. His charred corpse was found amidst the wreckage of a vessel in the vicinity of Halbertstadt. The great war is ended before it was ever commenced."

Ben Vintros listened with divided attention. For the first time in his life he experienced an emotion foreign to efficient work—grief. He had been very fond of his genial friend who now lay somewhere under the cruel lava. The President of the Europe-America Transport stepped up to him.

"Sinjoro Vintros, I think it goes without saying that you will take the place of Grando Blanco in charge of the construction. See to it that the work is speedily taken up again. Above everything, see that the crater-mouth is built up with rock so as to make impossible a caving-in of the mountain upon it. It was an inexcusable blunder not to have considered the inadequate thickness of the rock over the shaft-mouth to begin with."

Vintros did not reply. After the President had gone, his sister Edith came.

"Congratulations upon your promotion!"

And again Vintros experienced a strange emotion. The laughing congratulations of his sister jarred upon his sensibilities. Not a word had been said about his dead companion—not a sign of compassion could be seen in his sister's face. Yet he had been her friend, too. Was it something Professor Werner had said which came to his mind? "Man, after all, is more than a mere machine—appreciated while it is useful and to be thrown without sentiment upon the scrap-heap when it is broken." Was this foolish dreamer right, after all? Was a human being something more than sentient chemicals?

He laughed bitterly. Apparently that was all Grando Blanco had been—a machine. He had been a derrick with brains, excavating a shaft. Now the machine was broken and no one cared. No solemn funeral honored his memory. No immortal soul escaped his body. "Nonsense!" he said to himself. How could he let such thoughts rouse him so. It was all nonsense. "Yes, Professor Werner—Nonsense!"

He was startled, for he had spoken the words aloud—almost shouted them, as though he wanted to drown his thoughts with sheer noise. Grando was dead. Ben Vintros lived. Why not look at the pleasant side of that? Now he could carry the work to its completion and earn the applause of the world. Or, if it should so happen, he might follow his friend to the forgotten scrap-heap. Ridiculous! What was this thing called friendship? Just another prehistoric notion of the crazy professor.

CHAPTER XI

The Great Experiment

Grando Blanco was not dead. When the catastrophe began he had been a mile and a half down the shaft. The first rush of wind which had caused such destruction on the surface had hardly affected him. The force was so attenuated as merely to lift him off his feet and throw him on the floor of the gallery in which he stood. He was unconscious. The first explosion tore violently up the shaft, but did not directly affect the side-galleries.

Bela Wilson was attending a patient in the Doctor's cave. Between ministrations she read in a book taken from the Professor's' carefully guarded library. It was a strange book—a play, "Romeo and Juliet." Since the theater had completely disappeared, plays in any form were obsolete. It all seemed a senseless waste of time to the people of that age to mimic on a stage the very life they themselves really lived.

The terrific shock of the explosion shook the Doctor's cave to its very foundations and frightened Bela greatly. She ran out of the room but became lost in the passageways and stood trembling in a great room illuminated by rays of violet tint. Here Professor Werner kept his stock of human anatomical specimens. She had been here just once before with the Professor, and had cast only one shuddering glance around her.

Now she stood alone with trembling limbs. The shaking of the rock about her set all the liquid in the jars and bottles in motion. Or were they merely reacting to the shock of the catastrophe? The rolling eyes in those jars in the corner seemed to stare with an awed and terrified expression. Here a hand floating in serum closed its fingers and spread them again. The lungs seemed to expand and contract more quickly than usual. Half optical illusion and half natural result of the explosion, everything was interpreted by Bela's terrified mind as a conscious movement of these dismembered bodies all about her.

She pulled her senses together and staggered into a little cave opening off the room of horrors.

Will Gernholdt had been keeping an eye on Bela all during the time she was nursing her patient. Professor Werner was not unaware of this, as has been said, and followed the two with his thought receiver. Will Gernholdt had seen to it that Bela read the play "Romeo and Juliet" as part of his plan. But Werner was sad. He studied their inmost thoughts in his receiver. Here were two young people as he had wished—both capable of sentiment in this materialistic age. Through them he could have tested his theories. But there was no harmony of thought or feeling between them. Bela could not reciprocate the affection she had aroused in Will's heart.

But was this really so unfortunate? Of course Bela was young and strong, in spite of her delicate figure. She might very well have been capable of mothering a new race. But Will Gernholdt was a dreamer. His body was weak and with little energy. A race founded on such a frail reed could never prosper. These thoughts went through the Professor's mind a few minutes before the catastrophe. Will Gernholdt was stepping outside of the cave, a sad expression on his face.

What next happened did so in a few seconds. There was a deafening crash and a vast upburst of flame. Then the mountainside was rent violently and the flood of lava poured out.

The professor in his cave heard only the crash. The ground swayed and shook beneath him. Then all became quiet again. He opened the door and in leaped a man. His clothes were on fire and his face burnt and distorted, but in his arms he carried the body of a man even more badly hurt. He placed his burden in the arms of the Professor and collapsed on the floor. Will Gernholdt had saved Grando Blanco.

"Grando! Grando!"

The startled outcry of Bela, who was just then entering the room, recalled the Professor to the exigencies of the case. He laid the unconscious engineer on the ground.

"Oh my dear Grando!" The young girl threw herself on the body in a flood of tears. She pressed her lips to his as if to recall him to life by her very vehemence.

* * * *

Night had fallen. In the cave of the Professor no one knew or cared what had happened to the shaft nor who was now the engineer in charge of this structure. In the interior lay two men whose young lives would soon depart from them. Bela's great pleading eyes were fastened on Doctor Werner. Her anxious thoughts were incessantly begging him to do something. Her quick efficient hands assisted eagerly his every undertaking, as he tended the patients. Theodore Werner had never found it harder than now to attend a dying patient. He could not face Bela's eyes, which expressed such complete confidence in his ability even yet to save the life of the dying man.

He left her alone to watch over these two patients of his, who lay so quiet and motionless. She sat there holding her breath as she listened to the irregular beat of Grando's heart. At times it ceased entirely only to resume its vital work more faintly. Then she would hurry over to the other whose lips muttered deliriously, but whose heart was strong and regular.

* * * *

Professor Werner sat in his study in deep thought. The two young men were both doomed, he said to himself. A piece of flying rock had struck Gernholdt's head a glancing blow and crushed the skull. Grando had a broken leg and, what was more serious, a fragment of stone had hit his chest just over the heart. Both were doomed. One had a hopelessly crushed chest and injured heart; the other an injured brain. Brain? thought Werner. Heart? The two most essential portions of the body. The only two portions of the human anatomy he had not yet attempted to transplant in his operating room. Should he venture it? Should he try to tear at least one of the victims from the jaws of death? He rose. He had made his resolution.

● He had one question to answer. Should he save Grando or Will? Will—his favorite—the only one who understood him and sympathized with his theories! Then he thought of the young girl crying for Grando. He thought of the engineer's strong body and daring, brilliant brain—still uninjured. Put Grando's brain into Will's body? It was a million chances to one that he would fail. And besides, if one wished to mix two bottles of wine, would one not place the mixture into the more beautiful of the two containers? But Will's heart in Grando's body . . . !

With a determined look on his face he went back into the room where he had left Bela with the two patients. Had a Supreme Power in the meantime made a decision no longer necessary? Had one of them already died?

Will Gernholdt was still raving in delirious fever. But Grando's injured heart beat so faintly as to be almost imperceptible.

"Please leave the room, Sinjorina, I must be alone."

"Will Grando die?"

"I do not know. His fate is in the hands of the Lord. I must attempt a desperate remedy, but it will have to be applied quickly."

"Let me help you."

"I must be alone, I say. Pray to God that the operation may be successful."

Half hoping and half despairing, Bela tiptoed from the room. She found a chair in the Professor's study and sat with her face in her hands trying to comply with his last request. She prayed.

Werner hesitated for a moment, but Grando was rapidly sinking. The Professor's steady hand reached for a chloroform mask to anaesthetize Gernholdt. He felt like a

murderer, for the few swift incisions he must make in his friend's breast would mean instant death. Again and again he had to force himself to realize that death would occur anyway. He would but hasten the process. Will was dying, and he would only, after all, shorten his sufferings.

His hand was steady as his knife opened the chest cavity and laid bare the heart of his friend and assistant. It lay before him, beating powerfully. He tied up the veins and arteries and detached the heart from the now lifeless body. He had prepared a dish of serum and into this he placed the still living organ. This was all that remained alive of Will Gernholdt.

Now came the second part of the operation. With horror Werner observed that Grando's heart had ceased its beating! Quick! If the blood should be given a minute to coagulate in his veins before it could be again circulated by the new heart, then his operation would be in vain. He worked very rapidly, for he was now without emotion. He laid open the engineer's chest and removed the heart. It was still and even when placed in the serum it showed no signs of beating. A deep, ragged bruise showed upon its surface.

There was a minute of breathless activity. He took the heart of Will Gernholdt and placed the severed arteries and veins carefully against those in the body of Grando Blanco. With quickly, rhythmic movements he massaged the still living heart into a strong beat once more. Slowly the lungs expanded as breath came back to them. But when he ceased his massaging life promptly ceased to flow. Again and again he withdrew his hand, only to see the signs of life disappear when the artificial stimulation was stopped. It was like pushing the pendulum of a clock whose works are out of order.

Outside sat Bela in deep despair. She was stammering words which were prayers. She had several times jumped to her feet and listened at the door, but could hear nothing. She dared not enter. A faint ray of hope remained to her. If the Professor had failed, would he not have come out of the room before this? But perhaps he had abandoned Grando and was now saving Will—his favorite! At this thought she fell to her knees, wringing her hands, while the tears streamed down her cheeks. She was now a woman as woman had always been since humanity had been born. No thought entered her mind at this moment that she was a Knabina—destined either to a life of toil or to the profession of motherhood. She was a woman of the ages, full of love and fear and hope.

The door swung open and the professor entered. Bela wanted to scream when she looked into his pale, exhausted face. She brought a chair for him, for he was swaying on his feet. He sank into it—the picture of dejection.

"Wine. Strong wine!"

She did not ask the question for the terrible answer was already in her heart. She went for the wine. How could she ask? It was plain that this man had failed in his battle with death. Hastily Werner drank a full glass. The wine had been mixed with stimulants and he kept a supply of the mixture always on hand. Now his hand stroked his pale face. Hopelessly Bela asked him:

"Everything is over?"

He nodded, as if he scarcely heard her.

"Yes, it is all over."

"And Grando is dead!" An outcry of utmost pain came from her.

"Let us hope that his Maker preserves his life!"

A ray of hope flashed through her despair. She could not have understood him—was Grando still alive? But the Professor's head had fallen back loosely on his neck. Bela bent over him. Was he, too, dead? But he was merely asleep, his tortured nerves quieted by the drink. Silently Bela rose. With both hands pressed to her heart she crept to the door of the operating room. First she saw Will. He lay motionless. A white cloth was spread over his chest and his shattered head. He was dead. She had never seen death before, and it was gruesome and unpleasant.

Then she looked about her nervously. There, on the other table, lay Grando. He also was motionless, his body covered with a cloth. He too? Hesitantly she approached him. She could not bear it if he too were dead. She proceeded with faltering steps until she stood beside him. She looked at him with fear in her eyes. No, No! It could not be. She bent down over him. A low, painful moan came from his lips. But dead people could not moan! And again the tears began to flow as she knelt on the floor and pressed her forehead against the cold metal of the operating table. Her whole body shook with her great happiness and joy and gratitude to the great God to whom she had on this evening prayed for the first time in her life.

Werner woke with a start and looked about dazedly. He had slept through what was perhaps the most important moment of his life. He rose unsteadily to his feet. Where was Bela? Was she in the operating room mourning the patient he had neglected? How had he fallen asleep when a life depended on him? He reproached himself. In spite of that, had he by any chance succeeded? He went into the operating room and saw Bela sobbing on the floor. She saw him and half rose, with extended arms.

"He is alive! Lord in Heaven, he is alive!"

Werner bent over Grando. He removed the sterile covering of the wound, which was still open, for he had not yet dared to suture it. The heart was beating—this strong heart from Will Gernholdt's dead body. It was working away there quietly and regularly, pumping the blood through Grando's arteries. And yet the Professor, in spite of this apparent success, gazed wildly at Bela.

"Now leave again! I have to work on him."

"He is saved! He will live, won't he?"

"The most improbable things have happened—what follows is less difficult. But leave me alone."

● Again Bela left the room and resumed her watch outside. She did not know what thoughts were revolving in Doctor Werner's mind as he proceeded to close the edges of the wound in Grando's chest. Like all his operations, everything was arranged in advance and the surgeon worked alone. The patient lay unconscious and the heart pumped weakly, due to the loss of blood. But Professor Werner was not through yet: for he proceeded to remove the brain from the body of Will Gernholdt.

When he examined it, he at last felt relieved. His conscience had been bothering him. Yes! These injuries in his friend's cerebrum would have proved hopelessly fatal. It was really incomprehensible that he had not died instantly when struck. How had he been able to carry the

unconscious Grando into the safety of the cave before he collapsed? The Professor's face became calm. He sat down beside Grando and felt his pulse. It was strange. Only yesterday this man had meant nothing to him. He had even felt aversion for the cold unfeeling engineer who could not appreciate the treasure in Bela's eyes. But now it seemed as if he were an entirely different person.

To Professor Werner the fact that Will Gernholdt's was the heart which beat in his patient seemed confusing. What had he really done? Had he sacrificed his friend to save this engineer, or had he not on the other hand given the faithful heart of his friend a new shelter in Grando's body?

Slowly the night passed. Gradually a little color came into the patient's cheeks. Bela Wilson asked in a trembling voice:

"Is he safe now?"

Werner shrugged his shoulders.

"As yet I know nothing—nothing, except that I have just performed the most dreadful operation of my career and I shall never touch a knife again."

"But was it not successful?"

"Yes, the operation as such. He is alive , That is to say, his lungs expand and contract—his heart beats. But not until the wound is healed can I say definitely. Perhaps even later, after he is able to walk about. For there is danger that after-effects may undo all my efforts. But look here—this is Grando's heart. He died."

Bela stared at the lifeless organ, not comprehending.

"This is . . . . "

"Yes—his heart! I have given him another one. I . . . I . . . . "

A wild light shone in the Professor's eyes as he mumbled to himself. Bela quietly left the room. She had almost come to fear this man—was he altogether sane?

Outside she met Ben Vintros. He, too, had kept vigil all night.

"Where have you been, Sinjorina?"

"I watched beside Grando Blanco's bed all night."

"Blanco! Blanco is alive?"

"Yes. But he is under the care of a . . . . "

She had almost said "of a lunatic," but then she reflected that this lunatic had saved his life, after all, and she cut her remark short.

Ben Vintros was silent. He was in a solemn mood. Not for a moment did he think of his lost promotion—his thoughts were for his friend. Grando Blanco was alive! Why should he feel so happy because one man or another happened to be rescued from almost certain death? He looked into Bela's eyes and again failed to understand either his own or this girl's evident emotion.

Professor Werner had placed Will's corpse into a coffin. These he kept always in supply, for they were often required in this hospital of desperate remedies. His hands trembled as he placed the cover and fastened it down. Although he was certainly not a murderer in the eyes of men, yet to himself he could not but admit that he might well have been. He had acted the part of a god—controlling and directing life and death. Now that moment had passed and he was a weak old man—near the end of his strength.

CHAPTER XII

A New Life

● Nine days of anxiety passed for Bela. Professor Werner had locked the door of his cave dwelling and permitted no one to enter—not even Bela Wilson. She was now living in the newly erected Knabina Hotel.

At six o'clock every evening Job Alkins, the president of the German-American Construction Company, tuned his thought receiver to the wavelength of the Professor. Every evening the same stereotyped message and answer were exchanged.

"How is Grando Blanco?"

"He is alive."

Five minutes later a small placard would be posted on the newly erected construction headquarters.

"Sinjoro Grando Blanco is alive. Signed, Chief Engineer."

With trembling heart, Bela waited every day for this message to appear.

When she came home on the ninth day after Grando's operation, she found a radio message on her table.

"THE TIME IS UP. I HAVE TODAY REGISTERED YOUR NAME AT THE MOTHERHOOD INSTITUTE. YOU WILL REPORT A WEEK FROM TODAY. I EXPECT AT LAST YOUR OBEDIENCE."

Bela fought down her rising emotion. She knew she could not resist this law of the authorities. Yet she felt she could not bring himself to obey. Then again, she had lived close to Grando for weeks. She had tried to win his affection and had failed completely. He had tolerated her caresses and treated her little ways as those of a child. He did not know what love meant. He was a man of work who had artificially hardened himself against all emotion. The more she thought about it the more desperate she became. She could never do what her father had proposed—never! Rather than that, she would live the life of an unsexed Knabina.

Her father's message in her hand, she wandered down the road, which now consisted of smoothed lava. She must become a Knabina! She looked at these creatures, for many of them were just leaving their work for the day. They were strange to her—so unfeminine and terrible! But when she came to the door of the Baumann cave, it was not locked. As she approached it swung wide open and Professor Werner came out and stood beside her.

Bela was frightened at his appearance. Was this really Professor Werner—this bent, frail old man with the ash-colored face? He leaned heavily on a cane. His voice, too, had changed entirely and in his eyes was a light of utmost sadness.

"Come inside, Bela."

She flinched at his words. Had Grande, after all, really died? This was the day that all danger was to have been over. Werner had guessed her thoughts and a vague smile played on his wrinkled lips.

"Come. You shall be present when he wakes for the first time."

Full of emotion, she bent and kissed his worn hand. He made a gesture of negation.

"No, no! You must be firm now. This is the great moment."

She followed him into the interior of his cave-dwelling. On a bed lay Grando Blanco. He was still pale, but there was health and life in his calm face.

"Sit down beside him and hold his hand. I want you to be the first person he sees when I awaken him."

He stroke the sleeper's forehead and slowly the patient's eyes opened. There was bewilderment in his face. He had returned to life from the realm of death. Then the vague look concentrated on the young girl kneeling beside him. Bela was looking at him anxiously and with ineffable tenderness. Grando gazed at her slowly and said in a low voice, "You here, Bela?"

"Where else should I be, but by you?"

Grando remained silent for a long time. Then some slight color crept into his face.

"How beautiful you are, Bela! How very beautiful!"

No one had ever told her such a thing before. Grando weakly attempted to pat her hand.

"Beautiful and kind—dear Bela!"

Even as he spoke, his eyes closed. He sank again into profound sleep. There was a soft smile of happiness on his lips.

Bela was still sitting, not knowing what had happened to her in this brief moment. She only knew that there was something great and glorious that fate had presented her. Then she looked up, for she heard a low, quiet sobbing in the room. At the table sat Professor Werner—but no longer the cool, superior scientist—his head was in his hands and he wept.

"But professor!"

Werner raised his head. He looked at Bela as though he had never seen her before. Slowly he became aware of his surroundings, but there remained a strained look in his eyes. He sighed deeply.

"It was not in vain!"

Bela went over and put her arm around his bent shoulders, in a feeling of boundless gratitude to this savior of Grando's life.

"Dear, dear professor!"

He stroked her head paternally.

"Did you hear what he said to me? He never paid any attention to me before, and now . . . "

Werner nodded kindly.

"That is because he loves you, my child."

"But why should he suddenly change?"

There was again that wild, unreal light in Werner's eyes as he replied:

"There is a warm, loving heart in his breast. I must go now. You remain here. He will ask for you when he awakes. He shall see no one but you. You shall attend his every want."

With these words, he gently loosened her arms from around his neck and led her over to the bedside. He himself left the room and locked himself in his study. On the rear wall was something that had not been there when Bela had spent a terrible night of waiting in that room. A sort of altar had been hewn into the rock. It was the tomb of Will Gernholdt. Warner had built it in the first days of his voluntary confinement—in the days of doubt over Grando's life. He had regarded the dead Gernholdt almost as a son.

But Theodore had buried more than the mere corpse of his friend. In this sarcophagus lay those living organs and parts of human bodies which he had kept alive so long. Here lay all his knives and medical instruments. For he knew that after this culminating, almost miraculous, operation of exchanging two hearts, he could never again have strength or will to use his surgeons' knife.

He knelt in front of this rude altar. His heart was full of thankfulness and happiness.

"You are not dead! Your heart lives and our ideals will be realized!"

● Bela stroked Grando's forehead once in a while. What would his awakening bring? Would he again be the cold unfeeling engineer—or would she hear his kind voice once more? But he was waking now. He sat up in bed and Bela offered him a stimulating drink the Professor had left her.

"Are you going to stay here, Bela?"

"As long as you want me to."

"You must stay here all the time—always. You must nurse me back to health. I don't know what it is about you—I never noticed it before—but I feel as though you and I were closer than all the rest of the people in the world."

* * * *

On the fourteenth day, Ben Vintros was allowed to make a first visit to his friend. He had been very much rejoiced at his miraculous recovery. Grando reached for his hand.

"And how is the shaft-boring?"

"The catastrophe was terrific."

"Which catastrophe?"

Only now it occurred to Vintros that Grando was the only person in the world still unaware of what had happened. He listened calmly to the account; asked precise clear questions, and was once more the chief engineer in his manner. Bela searched his face anxiously.

"Have you been down to the bottom yet?"

"It will be several days before you are strong enough—but you are to be the first man down . . . . "

But Grando shook his head slowly.

"Not I! I don't think I will ever go down there again."

"You will recover, why not carry your work to completion?"

"No, Vintros. I will talk with the President as soon as I feel well enough. You will be the chief engineer and complete the project."

"Why not you?"

For a moment Vintros' mind was full of doubt. Was it possible that this daring man had lost all his courage? Then Grando said, with a pensive smile, "I don't know, Vintros. I have been thinking queer thoughts these days, as I lay here. Is it true that man has nothing higher to aim at than an ambition to become an efficient machine himself? Were the people of earlier days really wrong in believing that they had souls—that there was a great purpose behind life and a Master Hand directing it?"

Vintros looked at him without comprehension.

"The foolish professor has muddled your usually clear mind!"

"He has not spoken one word to me all these days since he saved my life. I must have been very, very ill. Look at this great scar in my chest! I do not know what the professor has done to me, but I must thank him alone for my life. My heart beats strongly and I will soon be well again—only—no, it is not the professor who has influ-

enced me. I don't want to be a mere machine any longer. I know what I want! I will ask for a quiet position—neither on the Moon nor in the mines. I would like to be in Yucatan or on the Amazon River. I want to see trees about me. I want to be alone much of the time, and think about things."

Vintros looked at Grando with regret. His illness must have affected this great mind.

"Poor boy! You will soon be yourself again."

There was a gleam in Grando's eyes.

"I'm not poor! I'm richer than the rest of you put together. I have been given a great gift."

"But Grando!"

The convalescent did not hear Vintros' exclamation. He drew Bela towards him. Vintros had not previously paid her any attention—thinking her a Knabina of the professor's. Grando pressed her head against his chest.

"You! You will stay with me, won't you? You will come with me. You love me as I love you and we two will be the only happy people in the entire world!"

Bela flung her arms around Grando's neck. Her eyes were filled with happiness. She forgot the presence of Vintros.

"Oh, my dear! I have always belonged to you. I love you more than my own life."

For the second time in his life, Vintros felt emotion rising within him. He had the first time learned that he was capable of friendship—a thing higher than mere ambition or work. That was when he thought his friend Grando was dead. And now—something was in the air of this room—something glorious and sacred. It shone from the eyes of these two as they embraced each other. Thoughtfully he left the cave dwelling of the professor.

Evening had fallen. The Knabinas were spending their recreation hours boisterously in front of their dormitory building. He cast a fleeting glance in their direction and began to walk up the hill. He climbed laboriously over the conglomerate of half-burnt broken tree trunks and chaos of destruction—up and up until at the top there were trees still standing. They were fragrant with mere life. He sat down on a stone and looked out through the leaves and branches to the green stretch of pasture which had been spared by the volcano.

The sun had solemnly disappeared like a ball of fire behind the mountains. Vintros felt as if he had never seen such a thing before. The sun had always been to him merely a large hot gaseous ball, whose function it was to furnish humanity with light and warmth. These trees—to him they had been mere material to supply engineers with strong beams for their structures. And a man—to Vintros a man had been a directing head which worked until it collapsed, when it must inconveniently be replaced by another one.

For the first time the idea of beauty had entered the mind of Ben Vintros. Beauty of the sunset—of the forests in their solemn green. But most beautiful of all were the two pairs of eyes he had left looking into each other in happy forgetfulness of all else. He felt as if he had lifted the veil from life itself. He had looked into a world which he could not understand.

He climbed down the slope to the valley. There he met his sister Edith, just about to proceed to the observatory.

"Good news for you! The President is expecting you. By the way, three new metals were found in the lava, which so far have not been known to occur on earth. How is Grando? I hear he is getting better. You must show him the analysis of this lava. He will get well all the quicker if you can tell him we have found both Gramonium and Herarium in the shaft. But I must hurry along. They tell me there are interesting things to be observed just now in the solar prominences."

With long, rapid strides she started up the hill. Ben looked after her. How ugly his sister appeared! But nonsense! Was she not an efficient and capable worker? Ben Vintros was angry with himself.

The sun had long disappeared and the light was fading from the sky. The trees now stood out crude against the half-darkness. Their momentary beauty had vanished for him. Down below him in the depths of the valley, the artificial lights glowed brightly. Here men were working to wipe out the effects of the catastrophe. There was the rattling of chains and the creak and clank of machines. There was work down there—the great task of man. Ben Vintros felt as if he had waked from a dream. He was a man and would do man's work. He had now only pity for his friend lying on his sick-bed.

Knabinas were busily hurrying about, carrying briefcases to their offices for the night shift. Those who had finished their hours of labor spent their time practising sports—throwing the spear, jumping the hurdles just like their male colleagues. What was beauty? These workers were efficient and that was, after all, a much more important thing.

● The next morning Ben Vintros was called to the office of the President.

"Sinjoro Grando Blanco has informed me that for a long time to come he will be unable to resume his duties. In other words, the same arrangements will apply now as I made with you upon the day following the catastrophe. You will remain chief engineer. In three days I expect a report advising the time now required to complete the shaft."

"Very well."

Not a word of sympathy for Grando's illness! No appreciation for what he had accomplished! Two hours later, Ben Vintros, newly appointed chief engineer, went down the shaft, the walls of which had been hardened by cold air. The poisonous gases were still present, but could not harm him in his diving costume.

The eruption had deepened the shaft by several miles. It was now easily apparent that other forces had acted as well. Right above the bottom of the shaft a black hole yawned in the side wall. Vintros and his assistants entered this and found themselves in a great cave. There must have flowed here a mighty subterranean river which had emptied its water into the boiling lava, thus considerably increasing the intensity of the explosion.

"We will have to investigate this river-bed first. It seems to take exactly the same direction we will have to bore our own tunnel later on."

The workers could not help feeling a thrill of fear as they realized that any time during the past month this river might have broken through into the shaft and caused the instant death of all at work in it.

Vintros remained two days under the surface and then returned to write and submit his report on this lucky

find to the President. He no longer had time to pay a visit to his convalescent friend.

* * * *

The world has been advised by radio of the destruction of the air-fleet of Asia and Africa, as well as the death of the two emperors. Rebellion had broken out in both these continents. Political parties were formed. In Asia a republic was proclaimed, although three men had announced themselves as Emperors in the place of the late potentate—a Hindu, a Chinese and a Japanese. Civil war was raging in Africa as well, where the north had separated from the south.

Both continents were thousands of years behind the Whites. The same thing began to develop as had in Europe six thousand years before: The population became divided into countless principalities and small states.

The Blancos were not displeased to observe this condition. It meant that the Black and Yellow peril was indefinitely postponed.

* * * *

The great fall of meteoric matter had caused enormous anxiety and consternation in the world. Everyone worked feverishly. The moon's appearance had been changed. The calendar had to be again revised. What had happened up there? Had there been a terrific cataclysm when the stream of meteors touched the lunar satellite?

The first rocket ships to visit the moon after the eventful day were no longer able to find the entrance to the great lunar mines. The moon had acquired an almost oval shape. It was circling the earth in twenty-six days.

Great showers of meteoric matter frequently struck the earth now. For the most part they affected only the equatorial regions. The Sahara was once more a waste, for the cultivated fields had been destroyed or buried beneath cosmic debris. The tides had increased. The Mediterranean was much higher and had flooded parts of southern Spain, while in the North and Baltic Seas the reverse was the case. Here the water was receding farther and farther from the shores. The huge task of reclaiming the Zuyder Zee, which the Dutch had undertaken thousands of years before, would now have been totally unnecessary.

Everywhere one observed meetings of scientific and engineering societies. There was need of utmost caution and preparation against further catastrophes. The solar prominences were hugely increased. The distinction between winter and summer was less than formerly. Theories of all kinds were rife, but one theory became more and more accepted. It was that of the ancient engineer Höerbiger, who had been laughed at for a fool six thousand years before.

Cities on the sea coast were now becoming deserted, and people more and more preferred to live in caverns, both natural and artificial, on higher land. Serious engineers, assisted by astronomers and physicists, had established great factories to build space ships in which refugees might seek to reach and colonize the nearby planets—Mars and Venus. Such ideas had been heretofore denounced as foolish and impractical. It was even suggested that other solar systems might be reached and humanity transplanted far away in space.

Ben Vintros had now completed the great tunnel which connected the long-finished shafts from America and Europe. It was a great day for humanity when the first "express"—an ingenious combination of elevator and track rocket-car—descended at high velocity, placed itself automatically on the tracks of the tunnel which it traversed at immense speed, to shoot up to the surface again at the other end, terminating its voyage in a grotto beneath Mammoth Cave City, the new capital of America. When the President delivered his speech at the opening ceremony, he referred in a few words to Grand Blanco—the father of the idea which was now completed. The few words he devoted to his memory mentioned "the pitiful figure of this once glorious scientist, who had been rendered insane by the catastrophe."

Bela Wilson had disappeared. She had last been seen at the cave of the foolish professor, but nothing could be learned of her whereabouts. What was one Knabina, more or less? She had been promptly forgotten. Her disobedience had embittered her father, Sinjoro Wilson, for a few weeks—that was all.

The race of humans was rapidly diminishing, however, for fewer women nowadays could be found willing to assume the sacrifices of motherhood. Why have children when the earth might any day be destroyed?

● Beyond the ocean on the banks of the Usamacinta, in Yucatan, in the former jungles of Brazil, new life had risen. Here was the grain resource of the entire earth. New fields were stretching out not far from the equatorial regions—where twice daily the great tidal-wave swept the shores and threatened to cover with water those strange heiroglyphics first discovered by the explorer Alexander Von Humboldt.

* * * *

Eight days after he had completely recovered, Grando Blanco had prepared to set out with Bela to begin his new life. They had for-gathered with the professor in his study. Here a strange little ceremony was performed: The two young people stood side by side and before them the dignified centenarian.

"Man has forgotten his Deity. In us He has been remembered in all His power. There are no true priests left, but I will speak to you as one. I will take your hands and join you in marriage as was done in ancient days—so that you may be as one and found a family: So that you may become the parents of a new race—a race which will once more possess ideals higher than those of a machine."

Theodore Werner married them in ancient form and then led them out from the cave.

"And now, farewell to you!"

"But father, aren't you coming along?"

(Both had become accustomed to address him as "father".)

"I have arrived at my goal." He sank back weakly with these words and fell to the ground lifeless. That night Grando and Bela had to perform a sad duty. They placed blasting material and laid a train. The explosion caused the entire cave to collapse. Master and scholar were to slumber forever in their common grave in undisturbed peace.

* * * *

Far away on a hill amidst tropical luxuriance stood a peculiar little table. Little figures were moving on its surface. They represented great machines at work nearby—harvesting machines, sowers, reapers, irrigation pumps,

most of them moving about on the tracks which covered the territory for miles around. Here were the same iron monsters Bela had so greatly dreaded—but how different it seemed now with Grando Blanco as her companion! Everything seemed different—even the little metal robot servant seemed to wear a pleasant smile when she introduced him jokingly to her husband.

These machines had a master now—and they had no terrors for her any longer. It was wonderful to be alone in their happiness—as they stood looking out over the farm.

Grando now knew the loving care of a true woman. He felt her tender regard as they walked slowly in the evening along leafy paths or through the fertile fields. He could no longer understand how mankind had forsaken such happiness as was theirs. What had they gained by abandoning these simple and natural joys?

The happy days came when children played about their feet. Then they learned what family could mean. They would sit in the evening in front of the Central buildings reading in the ancient books which had been the parting gift of the old professor. The outside world was busy preparing means to combat nature as she appeared ever more terrible and destructive. It had little time to remember Grando Blanco. And why should they? He was discharging his duties faithfully. He guarded and perfected those machines that were designed to produce nourishment for the human race. From time to time huge spaceships stopped temporarily to remove the harvests. From time to time Grando and Bela would visit the cities and walk through the almost deserted streets and notice how these workers and Knabinas—these "lords of the universe"—were retreating into their caves and underground cities. They would look for young men or girls who had not yet chosen their future occupations and who might help them in their task of founding a new race. They brought many to Santa Machina. Some returned but some remained when they saw how much happier life was there. Year after year there were more young people sitting with open eyes and ears before Grando Blanco as he taught them, or before the young and happy Mother Bela when she spoke to them.

Out in the world humanity pursued its joyless existence. But here in Santa Machina a new race was already rising. Was it by chance that this little spot had never yet been injured by meteoric matter? Again and again the earth had been struck, but here all was peace and security. Grando and Bela never stared at the skies with trepidation, They lived contentedly and confidently.

On the hill near the control table for the machines rose a small, curious structure. Grand Blanco himself had designed it, basing his plans upon drawings in old books. A little steeple rose from the top of the building. It was the first church that human hands had built for thousands of years. And Grando Blanco was the first minister of the new race. He worshipped the great God who held His hand over the fate of all mankind—the God in whom he and his adherents once more believed and to whose omniscience all things were plain, even that great question which civilization had been forever unable to answer:

The mystery of the human soul.

THE END.

The Death of Iron

(*Continued from Page* 309)

men were any good.' I tried to talk the 'Blue Evil' to him but he took it as a joke in bad taste. Well, you see I couldn't insist. After a minute or two of silence, he and Samuel told me I needed a rest. Faith, if my whole pile weren't sunk in the business, I would keep my mouth shut and get out."

Morain recounted the similar scene which had taken place in his office when Conrad, the manager of the Douchy mines, and one of the leading figures in the industry, had come to him to ask him the reason for the rumors that were going about. In vain he had demonstrated to this influential man that the trouble was engendered and had developed without human interposition, according to a process still obscure. He had encountered a man resolutely determined not to understand.

"He reproached me with having tolerated Selevine in my factory and said he had discovered Pierre was a propagandist for revolutionary ideas. Well, you know how it is with Selevine.

"I think he's too intelligent to be sincere about his notions and I have never attached the slightest importance to mere words. He's a bit proud, too. I had no choice. I had to get rid of him or shut my eyes to his opinions, and I took the latter solution as the more practical one, for his services were really indispensible. But several days ago I discovered certain remarkable facts, which I avoided mentioning to Conrad, who would be capable of hauling the whole affair into a law-court and getting us a lot of undesirable publicity. The whole question is so delicate that we can't be too careful. But I put Tullier on the job and he is making certain discreet inquiries.

"Do you know, in one of Selevine's letters we found a reference to the Siderosis, at a date when we didn't even suspect its existence. His observations helped considerably in pointing the way to the truth. And how can we explain his attitude to Conrad without accusing him? Finally a factory girl claims to have seen him taking a piece of sick iron into the store-room, where it was found later." later."

"Tell me, Morain, have you made any new experiments?"

"Yes, and they all confirm what we know in a general way. I have worked with sterilised irons subjected to high temperatures. The transmission of the disease can take place without direct contact and through a solid screen."

There was a knock at the door of the office and a secretary entered, presenting a special-delivery letter to the foundry master.

"It's from Malet," he said, after having glanced over it. "He wants me to come to a manufacturers' meeting tomorrow. Landry arrived at Valenciennes yesterday. Conferences, talking, inquiries and reports; I can see it all in advance. Exchange of notes and papers, an agitation which will gradually be transmitted through a hundred

departments and die out eventually, smothered in red tape. And meanwhile our factories are collapsing like houses of cards."

● Leclair, who was bored, alleged an appointment and went out.

On his way to Bellevue he met Mme. Morain, just getting out of her car and hastened his steps.

She was wearing a fur coat that made a frame about her face and her eyes seemed less grey than violet under the blue of the sky.

Raymond experienced a pang of emotion at the touch of her little gloved hand. A certain joy seemed to penetrate his whole being. It seemed to him that the young woman made the whole countryside look better. He asked permission to walk with her as far as Ronceraies.

It was the soft, sweet hour of twilight. Lights had begun to wink on in the distance. The city slept as though in the smoke of a thousand funeral touches.

Near the Escaut they were conscious of the fresh smell of the water mingled with the odors of earth and dead leaves. It was as though a perfume of gentle death mounted from the river's grey tomb, carrying to those who felt it a wave of sadness. All the surrounding country was outlined in sharp relief and had a certain serenity of aspect, like that on the faces of those who have died young.

Leclair asked his companion what her plans for the winter were. Was she going to the Riviera?

Pensive, she did not reply. Remarking for the first time that she seemed preoccupied, he asked the reason.

She confessed to a certain uneasiness.

"The socialist papers are attacking my husband so. They say he is responsible for the crisis and that he's starving the unemployed; yesterday he was booed as he left the factory. Monteuil is backing the movement. He's a terrible man!"

"A fanatic! The communists try to make campaign material out of everything that happens. We're used to them, and I'm really surprised that you attach any importance to their futilities."

"Futilities! Misery, hunger—"

"We can't do anything about it. In this general disturbance the owners are suffering worse than anyone else. Every day another one goes bankrupt. The unemployed aren't the only ones who have their trouble, believe me!"

Mme. Morain was unconvinced.

"What will become of them? I've seen things like that before. I have seen children begging in the streets and troops charging the workers. My father was not liked by his workmen. By instinct, when I was young, I feared and hated them. Since then, I have come to understand that it's not a one-sided question and I never think of the luxury around me without a kind of vague remorse."

"You forget that the work, the activity of your husband gives a means of subsistence to some thousands of workers. Their lot in life seems hard to you because you put yourself in their places with your refined tastes, your habits and your different instincts. Certain people try to persuade them that they are actively unhappy. How in the world did you come to be taken in by this foolish humanitarianism? Selevine's talk?"

"You still think he was to blame?"

"Who, Selevine?"

"Yes. Haven't you been accusing him?"

"His part in the whole business is so obscure. No one really knows. Certainly he did not create the Siderosis. I imagine the first germs probably appeared spontaneously in the course of the experiments with which he has been busy for so long. Surprised at first, he wished to use them for—"

"Absolutely not! Selevine is no doubt capable of acts for which ordinary morality would reproach him, if he thought they would advance his ideals, but that he would stab his friends in the back I will never believe."

"How much heat you work up in his defence," commented Leclair sarcastically. 'Oh, I have noticed how he looks at you! The manners of the savage don't displease you after all, do they? Come on, admit it."

He was repentant at the sudden irritation in her eyes and went on rapidly:

"I was joking. Pardon me. Just the same it is curious that we can't talk for a minute without the subject of Selevine coming up. It's a regular obsession. You, a young woman, rich in all the gifts of beauty and mind, sensitive to affection, made to love and be loved—how can you find any pleasure in the society of sociologists and scientists? You are wasting your youth here."

"No. I'm attached to this place by memory and habit. I like it for these reasons and for some others which you wouldn't understand. Now, Monsieur Leclair, you must have a very frivolous conception of what women are like. I don't doubt but that you have known some charming ones whose character more nearly approached your ideals."

Leclair searched his mind for some intelligent reply and was irritated not to find any. Ordinarily he was a brilliant conversationalist, and knew just how to find the word which would flatter and pique the curiosity of a woman and little by little lead the conversation into more intimate channels, but Mme. Morain seemed to paralyze him.

He hazarded, heavily:

"Perhaps it's because I'm certain you are unhappy."

The whistle of a nearby tug drowned the end of the remark.

The night had almost come, but in the west a greenish light still persisted. Above Wavrechain, pillars of smoke caught a blot of red light that was being slowly swallowed up in the environing shadows. Cinders borne down the wind danced in the road ahead.

Lighter than thistledown a flake lit on the shoulder of the young woman. Her face appeared a white oval in the gloom, in which the only distinct features were the marvels of her eyes and her encarmined lips, and to Leclair she seemed more mysterious and desirable than ever. What did words matter? In his thought he caressed her unclothed body. He was still absorbed in such erotic imaginings when she turned at the doorstep and extended her hand.

"Good night, Monsieur Leclair. I pardon you your impertinence. Be as kind to others in the future, and be a little more tolerant in your judgments."

● Morain had succeeded in increasing the resistance of steel to the malady (though without conferring upon it any real immunity) by applying certain physical treatments. After a space of time the usual effects would appear; but the new product was good enough to meet tests specified in contracts and to secure acceptance of delivery.

With Gamus he had launched a new enterprise—Duro-Fer, Inc., but the profits fell considerably below the expected figure.

The time was hardly favorable for marketing metals and the wood workers and manufacturers of cardboard were the only people doing really good business. Most of the industrialists, to avoid trouble, had become skeptical of the new alloys of which hundreds were being marketed by unscrupulous firms. But the government departments, attached as they were to their little customs, continued to acquire armorplate and guns whose rapid decay was inevitable. Battleships left port carrying with them the invisible elements of their own destruction. Even the pacifists were horrified at this swift decay of France's armament.

The foundry-master had been forced to lay off the greater part of his workmen. In the department devoted to the production of fine steels and special alloys a certain activity alone persisted. Chouleur was there deploring the general misfortune with the more sincerity since it involved the end of his own job. Winter with his goat-like head, was with him, and Lefevre, lost in calculations of the resistance of metals, and old Martin, the deaf and stupid.

Morain, assisted by Leclair, worked twelve hours a day in the factory, carrying on the battle step by step. He had undertaken systematic experiments, selecting the best irons, mixing them with elements intended to give greater resisting power. Enamels of the right thickness, for instance, constituted a formidable obstacle to the inroads of the disease. Large stores of refractory materials, ready to be converted into arms and tools at some later date, accumulated in the store-rooms.

Haunted by a fixed idea, Morain hardly slept, but with eyes wide open in the dark, dreamed of means of getting at the essential essence of the malady and conquering it. In his brain, fevered with insomnia, numberless ideas marched back and forth, but with the cold light of dawn the sensation of his powerlessness would return and dissolve all these disordered calculations.

To help him in his laboratory he had hired a little red-faced man who ran down to the foundry every ten minutes to look over the crucibles and returned with a face like a little red sun after bending over the fiery material. Osmond, with a reputation for achievement in metallurgical chemistry, busied himself with the researches that had been Selevine's special forte.

Morain could not but make comparisons not altogether to the advantage of the newcomer. At bottom he regretted that he had ever thrown away what was, after all, the best chance of saving his factory. Even if he were at the bottom of the trouble, the Russian might have repented, repaired at least a part of the damage he had done and brought lucid intelligence to the task that was crushing them all. It would have been necessary to handle him carefully, drawing him out and making him reveal the secret places of his heart.

The steel man recognized the skinny silhouette of his former assistant on the horizon one night. He was tramping along as though burdened with sorrows, coatless in spite of the cold weather. A kind of pity touched Morain's heart, but the other had vanished into the distance too rapidly to be recalled, even if the steel man could have made up his mind to do it.

In everything he attempted the same indecision was manifested. He who had always been prompt in resolution, firm of will, found himself perplexed and hesitant before resolving upon the slightest decision. The difficulties with which he was struggling were slowly devouring him. He found he could only maintain his nervous energy for the superhuman amount of work he was called upon to accomplish by drinking enormous quantities of coffee. Drugs put his fears to sleep or filled him with a temporary fire that uplifted his fading energy. He carried on a desperate conflict, harried by the necessity of keeping engagements with means that became daily more insufficient and overshadowed by financial difficulties which were aggravated by hesitating and unhappy speculations.

The aid he received from the government authorities was insignificant. The cabinet, frightened by the amplitude of the crisis, refused to accord any further subsidies to the industry. Investigations went on so slowly in the factories where men of science gathered to discuss the origin of the Siderosis in learned terms. From his interview with the most celebrated of them all, Landry, the foundry-head carried away only the impression of having talked with a very nice old gentleman.

The scientist had caressed his beard, listening to Morain's explanation with a far-away air. Such phenomena were an offense to his reputation, to the Academy and the sacred name of Science, which could not find a place for them in its catalogues. Landry, who had made his reputation in electronics, felt himself personally insulted by the manifestation of a form of energy which escaped all classification. He had the impression of a sort of rebellion of the infinite against the just rules imposed by mankind; a triumph of chaos over established order. An insurmountable repugnance deprived him of his thinking powers. Not wishing to compromise his reputation by snap judgments, he had given the assurance that researches would be carried on along the lines indicated by M. Morain, who from that moment had heard nothing further from him.

The papers, however, had begun to talk about the Blue Evil and their paid campaigns, backed by companies of stock-manipulators, began to create some excitement.

Upon its being brought to his attention, the Prefect of the Department du Nord emerged from the torpor into which the prospect of intervening in so curious an affair had plunged him. His secretary had searched for a precedent through all the files of the prefecture without result. One would have said that it had come up with the sole purpose of upsetting an excellent official, careful to preserve law and order in his department. After having heard several reports, run through numerous files of papers, he reflected for a while and then decided to send a squadron of cavalry to Denain.

The horsemen arrived in the city one morning. The pale rays of the early sun of March played on their polished cuirasses. Arriving at the city hall, they dismounted while the children regarded them admiringly, attached their horses to the trees and went off to eat something and drink a little wine.

(*To be continued*)

Red Flame of Venus

(*Concluded from Page* 359)

the Flame Flower. Bill couldn't help admiring those priests. From every last stronghold on the planet they had rallied to fight in the royal courts for the lives of the survivors of the carnage in their holiest temple.

They hadn't a chance. Out of sheer sportsmanship, Noreena set aside the argument, fatal in itself, that they broke the ancient laws in existing as priests of an outlawed creed. Enheartened at this sign of weakness, they shifted from defense to attack and with utter insolence brought up Atampa's charges, daring her to disallow them. Then it was that a steely glint crept into her eyes.

Under their shameless assault she let her defense weaken, crumble away to nothing. Aghast, the court saw her convicted of bestiality, of murder, of sacrilege and blasphemy. They saw her conspiring against the emperor, her father, to give over the planet to a race of brute beasts. They saw her stealing the bread from Venusian mouths to cram it into the insatiable maw of Earth. They saw that death, and slow death, was the only possible sentence that she and Bill should draw. In horror, they saw that even where the defense was obvious she seemed dazed, blind to it. And strangely, neither she nor Bill, after the first few charges, seemed to be worried. Was this a suicide pact? Realizing that they could not mate, would they forfeit their lives and let these conspirators go free? Or were they bewitched—mad?

Nastily exultant, the spokesman of the priesthood of the Flame Flower closed his case. He glowered out over the pale faces of the courtiers, fingered his straggling beard, and shot his bolt.

"I demand," he shouted, "that the charges against my brotherhood be withdrawn, that this woman be placed on trial with her beast from Earth, on the counts which I have already proven. If there are no further charges, I demand dismissal and the immediate trial of this creature and her lover!"

Noreena's face was expressionless, but deep in her eyes something glittered, hard and cold and merciless. Enigmatically she stared down at him, then in a low, vibrant purr she spoke.

"You dare?" she whispered. Her slender fingers flexed like the claws of a giant cat. She moved to the edge of the dais. Her cold smile came again. "Tell me a little of the Flame," she said. "Is it a true brotherhood, as you have claimed? Are all equal before the god, or does one stand above the rest, greater than they? Tell me."

The priests stared at her bewildered. The faces of the courtiers were blank. Even Bill was puzzled, but in a moment he saw light, as the spokesman of the group gave his answer.

"We are brothers before the Flame and before men," he proclaimed haughtily. "We are one being, with heart and head and hands serving one body, and our soul is the Flame. We stand here in this place of justice as we have always stood, a single man, asking judgment. I am the tongue of the Flame, and I demand that we be judged as the law decrees!"

Noreena bowed stiffly. "So shall it be," she acknowledged. "As one man you have fought against me, and come to be judged for your crime. What has been done is the deed of all. It is well." She stood a moment, silent, gazing into nothingness. The court sat petrified, horror-struck. Was this all? Would they go free? Was she mad?

Suddenly her eyes blazed. She towered above them, her lips carved by a cruel smile, a goddess of awful vengeance. Her voice was silken, yet her words cut like the edge of a keen blade.

"They have sworn to the truth!" she cried. "They have told of how I grovelled on my face before a forbidden god while they stood in horror and watched. They *stood*—stood mocking above me, a Princess of Laxa! Remember the law, brothers of the Flame! As one man, whether ye come from Laxa or from Narsook or from Keeth, ye will pay the penalty! Guards—seize them! They have stood as one man above a daughter of the emperor!"

* * * *

There were certain inevitable changes in the personnel of the palace staff. Not a few had been devotees of the Flame Flower. And Bill's vacation was over.

He stood with Noreena at the window where he had stood a scant fifteen days before, wondering about Atampa. And now—

"I hear you're getting married," he said.

She nodded. "Yes," she admitted. "It will be soon. It has been arranged for long, since I was a child."

"I know," he told her. "Rillo told me." He laughed, shortly. "Funny, isn't it, the way we've been," he said. "You better not let your husband get wind of it. He'll come raying for me!"

She smiled. "Yes, Beel," she agreed. "I fear he would not understand. We do not do these things in Venus, even in Laxa. The court has been horrified—frightened for me and for Venus. Even now, I think they do not believe—but what of that? For a little I have been free and young, like other women on other planets. Without you I could never have dared it. It was here, in my heart, but there was no man of all Venus to bring it to life."

She laughed, bitterly. "Think of me, Beel—like these women of the court, prim and dry and proper and always frightened. I would have been in your Hell, but there would have been no release. And now—now I can remember my Paradise. Now I am Noreena, not just a Princess of Laxa!"

Bill rose to his feet. "Right you are," he told her. "Pals is what they'd call us out there, on Earth and wherever Earth's men are, and not the usual kind, even there. If that husband of yours ever tries to sit on your safety valve, you just send me an S. O. S. and I'll hop right over and help you raise a few roofs for him. And it'll be fun!"

He squeezed her hand. Bending over, he nipped her ear gently. Then with a sweeping bow and the lift of a hand he was gone.

"So long, pal," he said. "Vacation's over. But—I'll be seein' you."

And the soft light of memory in Noreena's eyes told him she would be waiting.

THE END

Armageddon

(*Concluded from Page* 345)

and command their husbands in things pertaining to marriage and the home, that in certain matters they have the power of life and death over their mates—that is well, and perhaps as it should be; but it wasn't always so.

In the fifth year after the destruction of civilization or the sixth, or seventh—I am an old man and my memory unreliable—Williams and I discovered a small duplex eight intact in a hanger, with an ample supply of motor fuel. We had often talked of the possibility of some remnants of the old government having survived in the east; so in this craft we ventured aloft and scoured the surrounding country for a radius of two thousand miles.

But the towns we visited were devoid of human life, and—this is a strange thing and one I have never been able to explain satisfactorily—great buildings were rapidly moldering into dust, stone and steel and brick disintegrating, falling to pieces. Perhaps the explanation of the phenomenon lay with the fog-balls we saw everywhere, seemingly driven by the winds, or by some power of propulsion resident within their gloomy depths.

That they were deadly to human life I have already explained. The flesh of bodies discovered after the fog had left them was curiously mottled and bloated, like the flesh of those long drowned. Williams advanced the theory that the fog-balls were the agents responsible for the quick dissolution of mighty skyscrapers, factories, and other structures.

"Settling over a town," he said, "they eat into steel and stone. Look," he said pointing down, "that city is blanketed by one now."

We stared gloomily. The thought that the habitations and works of civilized man were swiftly being reduced to ashes was a depressing thing.

"In a few short years," said Williams sadly, "there will be nothing of them left—nothing. Maybe a ruin here and there." He shook his head.

We had depended on finding fuel on our trip, but only thrice did we do so. For the most part fuel had blown up, evaporated, or containers had sprung a leak. Little we saw was whole or sound; and in all the vast distance covered not a sign of human life was seen. Cattle roaming the plains, herds of what seemed wild dogs or coyotes, flocks of birds, but of man, nothing. Once we did notice smoke rising from a forest, and this may have indicated a campfire. But though we hovered above the spot and fired several shots, our signals were not returned.

As far as I know, this was the last aerial voyage ever made by human beings. Later, many an aircraft was found in the course of our nomadic wanderings, but in a state of decay, and the towns and cities visited held little of value.

Soon our firearms were useless for lack of ammunition, and most of the salvaged tools, knives, hatchets, crumbled under use. Those remaining sound became of increasing value, and scarce. Gradually primitive weapons began to appear: the bow and arrow, the spear, the sling-shot. Years passed, fifteen, twenty of them. How can I tell you of the ever-shifting scenes and customs?

It was in the thirtieth year that Williams decided to lead the tribe to the Pacific coast. There were two reasons for this. One, a homesick feeling to see old scenes again before he died; and the other, because our hunting grounds were being invaded by copper-colored people (doubtless Indians from Mexico) in increasing numbers.

● It was a toilsome journey, and a slow one. Only heaps of stone and rubble marked the sites of towns passed. The young men and women, and the children, who knew nothing of their origin, who hardly credited as true the absurd tales of their elders, viewed them blithely enough; but the hearts of those of us who had lived before the destruction were heavy.

I will not weary you with a recital of how finally we came to the spot on which Los Angeles once stood. Around the council fire that event is commemorated in song and story. Nothing of the great city remained. Coarse grass was growing in patches; but there were desolated stretches of barren ground, and in the midst of all something rumbled and roared and spouted a blue mist—the aftermath of that mighty explosion which had continued for two decades and was even now not subdued.

The great chief Williams died the day of our arrival. He had been ailing for some time. Ere breathing his last, he raised himself weakly on one hand and looked long and earnestly towards the spouting mist of blue.

"Listen," he cried, addressing his followers. "This is your land, the land I have brought you hither to possess."

I think he was delirious at this time, burning with fever, for he continued: "The blue flame is a devil-god and once swept the earth. But Jee-han," he said wildly, giving me my name in the corrupted tongue and laying a hand on my bowed head, "will guard you against its wrath. Trust in Jee-han."

He died then and we buried him, even within the shadow of the blue flame itself; and that is how I became high-priest of the tribe; for slowly but surely a religion was taking shape in the minds of the people, and here on the dust of a dead city and a dead civilization, it crystallized into the form you now know.

I am old, incredibly old. I have watched our tribe go up against the tribes to the northward, to kill or be killed. Years ago the last one of my contemporaries passed away. While living they formed an hierarchy of priests. But I still live. Perhaps that is because of all men I only dared to breathe the fumes given forth by the blue mist. In the times that once were, in a land called Russia, scientists experimented with ionization of the air. In this spot the air is highly ionized. I breathe it, it prolongs my life. And this also explains the miracles of healing I do for the sick and diseased. I take them blindfolded before the god, for daily prayer, and they are cured . . .

But now my time is at hand. I am tired and would sleep.

Perhaps in that sleep I shall dream again of the mighty ships of iron and steel that plowed yonder sea, of the huge and winged mechanical birds which bore man a conqueror through the air. Perhaps I shall walk again on winged feet and live once more in the glorious cities lust and greed destroyed with such cruelty and violence. For even before the industrial civilization that died, there lived a great scientist and mystic, Swedenborg by name, who enunciated the law of correspondents: As on earth, so it is in heaven.

THE END

Science Questions and Answers

This department is conducted for the benefit of readers who have pertinent queries on modern scientific facts. As space is limited we cannot undertake to answer more than three questions for each letter. The flood of correspondence received makes it impractical also, to print answers as soon as we receive questions. However, questions of general interest will receive careful attention.

The Distances of Constellations

Editor, Science Questions and Answers

1. Could you tell me how many constellations are within one hundred light years of earth?

2. What velocity is necessary to attain a contraction of length, according to the Fitzgerald Contraction theory of ⅛, ¼?

Burleigh Suit,
Covington, Va.

1. (Our correspondent is probably under the erroneous assumption that a stellar constellation is a group of stars all of which are at the same distance from earth. A constellation is simply a term used to describe a group of stars in a certain part of the sky. Thus the "Big Dipper" is a collection of six stars that seem to form the figure of a dipper. The stars are at varying distances from the earth, and have no relationship to each other.

2. The following table, worked out from the Lorentz-Fitzgerald construction formula show the contraction in length of a unit length if it moves at given speed. Thus in the table, L represents the amount of contraction in length. So if the original rod was one foot long, then when L is .9 it means that at a speed of 185,000 miles a second, the length of the rod will be decreased .9 or the foot rod will be only .1 foot long.

L	V(miles/sec.)
.90	185,000
.80	182,300
.70	176,700
.60	170,400
.50	161,600
.40	148,800
.30	132,800
.20	111,600
.10	81,100

It will be noted that for a definite amount of contraction of length a greater increase of speed is necessary in the lower speeds than in the upper. To get a contraction from .10 to .20 of length the speed must be increased 30,000 miles a second; while to increase the contraction from .80 to .90 only a 2,700 miles a second increase of speed is required.—Editor)

The Compton Effect

Editor, Science Questions and Answers

Professor Arthur H. Compton was declared Nobel Prize Winner in Physics for 1927 for his "Compton Effect," which has altered the whole scientific theory of light. What is the substance of the "Compton Effect"?

J. S. Hoerl,
San Francisco, Cal.

(Although Compton's research has exerted a great influence on modern physics, we would not go so far as to say that it has altered the scientific theory of light.

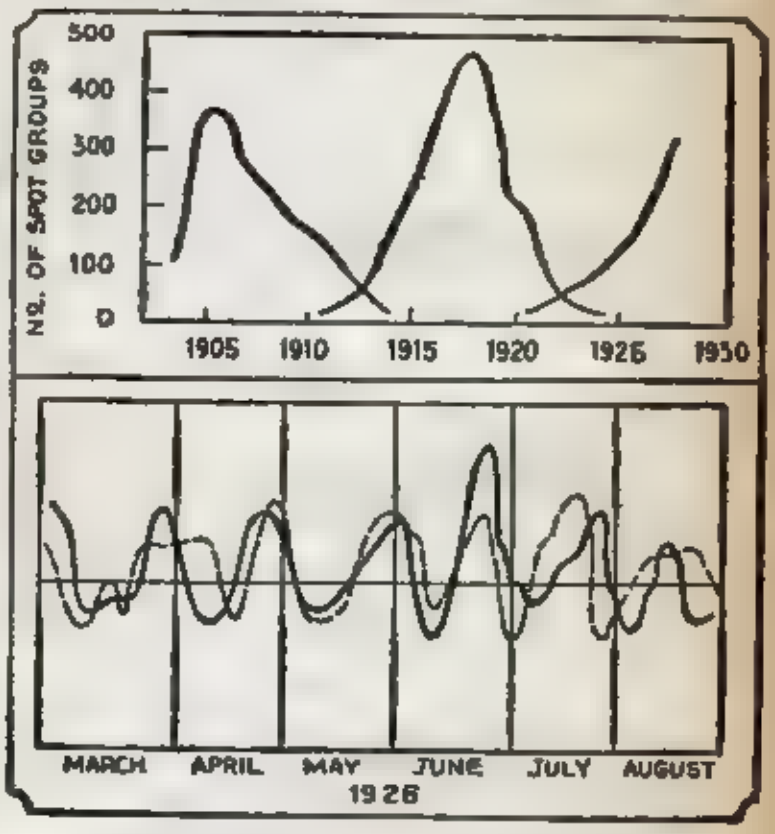
When Compton was making his experiments, the scientific world was divided into two camps —those who believed that light traveled in waves, and those who believed it consisted of small particles of energy.

Planck had enunciated his Quantum Theory which stated that radiant energy, such as light, heat, X-rays, ultra-violet rays were not continuous as waves but really came in small packages or quanta. This theory tended to undermine the whole wave theory of light.

Planck in substantion of his theory, stated that waves of different frequencies contained different amounts of energy. Thus the greater the frequency of a given amount of radiation, the more energy it contained. Thus if red light were played upon an object for a certain length of time, less energy would be emitted than if ultra-violet (whose frequency is greater and wavelength smaller) were used.

Compton wished to test Planck's theories. He used X-rays, which he permitted to be shot at a target, and then measured the energy of the rays emanating from the target striking a second target. He found with surprise that the waves that left the first target contained less energy or less penetrating power than those which he used. It was as if the electrons of the first target had absorbed part of the energy of the rays. The action is similar to shooting a lot of white billiard balls in among blue ones. The white balls are the X-rays, the blue ones are the electrons of the target. The white balls hitting the blue ones will set them in motion, but when the white ones rebound they will have less energy, for they will have given up part to the blue balls.

Now if radiant energy consisted of particles or quanta, and not waves that was what would be expected. Therefore the observations of Compton on X-rays, showing that the X-rays rebounding from the target had less energy than those hitting it, was deemed evidence in favor of the quantum theory of energy and the corpuscular or particle theory or light. But the battle between the two has not been definitely settled.—Editor)



The upper curve shows the variation of the number of sun-spots over a period of twenty years. Their cyclic rise and fall in frequency every eleven years is quite evident. At present we are reaching the peak of a sun-spot cycle.

(*Illustration from "The Sun, the Stars and the Universe, by William M. Smart, Longman's Green & Co.*)

The lower curve shows the variation in sun-spots as compared with radio reception. The full line represents sun spots and the dotted line the strength of radio signals. The correspondence between the two curves is evident.

(*Curves from "Man and the Stars" by Harlan True Stetson, Whittesley House*)

Sun Spots

Editor, Science Questions and Answers:

What are sun-spots? How are they caused? What is supposed to be their effect on the earth, as on radio, the weather, etc.?

Jeroma Beley,
Newark, N. J.

(Sun-spots are areas of comparative darkness on the surfaces of the sun, contrasting with the brightness of the rest of the luminary. They had been observed for several hundred years but it was only in 1843 when Schwabe, a Germany apothecary, began a 30 years study, that definite light was thrown on them. Schwabe observed that the number and intensity of sun-spots came in cycles of about 11 years. There was a period of comparative freedom from them; they gradually increased in number until they reached a maximum and then decreased to a minimum.

It was discovered also at the time that fluctuations in compass needles from the magnetic north on earth increased and decreased with the waxing and waning of sun-spots.

It was the motion of sun-spots across the solar disc that gave evidence of the rotation of the sun on its axis, the period being set as between 25 and 27 days for a complete revolution.

It has been discovered that sun spots are areas of lowered temperature on the sun caused by sudden expansion of gases. Magnetic storms are associated with this phenomenon, and sun spots generally occur in pairs of opposite magnetic polarity. Possibly they are magnetic whirlpools of free electrons and protons. They have been described by Harlan T. Stetson, astronomer of Perkins observatory as "terrific storms in the sun's atmosphere, cyclonic whirlwinds for which the most violent tropical hurricane would be a microscopic illustration."

The fluctuations in magnetic activity on earth; the brilliant displays of the aurora borealis, are due to sun-spot activity. The correlation between radio reception and sun-spots has been studied since 1926. Evidence shows that the impairment of reception of radio signals is directly proportionate to the number of sun-spots. The theory is, regarding reception, that the increase in sun-spot activity causes an increase in the bombardment of the earth with free electrons thus ionizing the air. Since the Kennelly-Heaviside Layer is but a layer of ionized gases, sun-spot activity is equivalent to a lowering of the Heaviside Layer, thus upsetting radio reception.

Curiously enough it has been discovered that for certain long wavelengths, such as those

(Continued on page 382)

READERS

If you like "Science Questions and Answers" in this magazine, you will find in our sister magazine, EVERYDAY, SCIENCE AND MECHANICS, a similar department, greatly expanded called "The Oracle." Look for it, you science fans!

HERE IS A MONEY-MAKING IDEA!

$ $

START A BUSINESS OF YOUR OWN
With Our Recipes, Formulas and Trade Secrets

This is a Positive, Easy Way to Security and Independence

NO MAN is safe in a job today. No man has a future in wage work.

The only sure way to avoid low-paying jobs, unemployment, and constant worry is to go into business for yourself.

Our New Formula Service offers you a marvelous opportunity to be your own boss, to be independent, to make money steadily and easily — right in your own home!

Quick Results

You need no special knowledge or skill to manufacture any of the products comprised in our Formulas. You can build up a substantial business bringing you real money, the comforts you desire, an established future. Many men and women, of no greater previous experience than you now have, are making and selling their own preparations in all parts of the country today—and making money! You can do it too!

It's Easy

You'll be surprised to learn how simple it all is. We show you everything. Besides furnishing the formulas and recipes, we give you full directions for mixing, measuring, etc. We tell you how to package and price your wares, and then we show you how to market them. In fact, every single step is explained to you so thoroughly that it is impossible for you to make a mistake.

CHOOSE YOUR OWN BUSINESS

Here is a list of the sets of chemical formulas and recipes, with which you can start your own business. _____

Set A. Contains 20 different formulas and recipes for manufacturing cosmetics, including creams, lotions, shampoos, hair tonics, dental preparations, hygiene aids, etc.

Set B. Contains 25 different formulas for metal polishes, automobile polishes, solders, compositions and alloys.

Set C. Contains 30 different cleaning, dyeing, spotting and bleaching formulas.

Set D. Contains 30 different formulas for paints, enamels, thinners, lacquers.

Set E. Contains 25 different formulas for special glues, cements, mucilages, etc.

Set F. Contains 15 different formulas for disinfectants, water-softeners, household and first-aid remedies, etc.

$5 per set

Big Profits for You!

In a very short time you can put yourself on Easy Street. You sell your product for at least five times as much as it costs you to make it.

Begin at Home Immediately!

All you need to get started is a desk or a table to work on right in your own home. You begin in your spare time, but you'll become so enthused about your enterprise with its quick money-making possibilities that you'll soon be giving every minute of your time to it.

$5 Starts You in Business!

You can get the formulas and recipes listed here for the ridiculously small sum of $5.00 per set. What's more, most of them are trade secrets which you could not possibly get anywhere else.

Get the Jump – Act at Once!

Don't let anybody else in your community get ahead of you. Pick out the formulas you are particularly interested in, from the list on this page. Use Coupon when ordering. Act immediately. Mail the coupon today.

Chemical Institute of New York, Inc., 19 Park Place, New York, N. Y.

Founded in 1921

Formula Service Division

CHEMICAL INSTITUTE OF NEW YORK, Inc., Formula Service Division, 19 Park Place, New York, N. Y.

Enclosed find my (check, money order) for $ ....., for which please mail me the set(s) marked X of your Chemical Formulas and Trade Secrets, with complete directions.

- ☐ Set A. 20 Different Cosmetics, Toilet Aids, etc.
- ☐ Set B. 25 Different Metal Polishes, Solders, etc.
- ☐ Set C. 30 Different Cleaning & Dyeing Processes.
- ☐ Set D. 30 Different Paints & Enamels.
- ☐ Set E. 25 Different Glues and Cements.
- ☐ Set F. 15 Different Disinfectants, Household Remedies, etc.

Name _____

Address _____

City _____

State _____

WS-932

IN this department we shall publish every month your opinions. After all, this is your magazine and it is edited for you. If we fall down on the choice of our stories, or if the editorial board slips up occasionally, it is up to you to voice your opinion. It makes no difference whether your letter is complimentary, critical, or whether it contains a good old-fashioned brick bat. All are equally welcome. All of your letters, as much as space will allow, will be published here for the benefit of all. Due to the large influx of mail, no communications to this department are answered individually unless 25c in stamps to cover time and postage is remitted.

On Mental Telepathy

Editor, WONDER STORIES

Why do you keep bringing telepathy into your stories? You are supposed to serve science fiction, and often you serve excellent stories along scientifically conceivable lines. Isn't that your principle? Then why do you take a perfectly good science fiction tale and spoil it for the reader over nine years of age by introducing magic!

Messrs. Grimm, Hans Christian Anderson and L. Frank Baum have written more delightful stories of magic than your readers will ever write. So why not stick to your potentially very enjoyable function of giving science fiction, and leaving out magic:

H. J. Weber,
Chicago, Ill.

(Mr. Weber's question is a fair one, and deserves answer. We might say that the primeval savage who saw the first brother light a fire must have whispered, "Magic." And when an adventurous prehistoric man put a sail on his rude craft and sailed smoothly out to sea, his land-faring fellows must have whispered, "Magic." The word "magic" has been said millions of times from the day of the discovery of fire to the building of the first radio set. So the accusation of "magic" has lost its force.

Now about mental telepathy, we have no conclusive evidence one way or another that two minds can communicate freely without any physical medium. But even conservative scientists are willing to admit its possibilities (though they deny spiritualism, which is quite different from mental telepathy). Professor William McDougall one of the foremost living psychologists says, "the evidence for the reality of telepathy is of such a nature to compel assent of any competent person who studies it impartially." And one of today's oldest and most respected scientists, Sir J. Arthur Thomson, says in his "Riddles of Science"—"it appears to us that telepathic experiments have yielded reliable data well deserving the most thoughtful scrutiny. There is strong—if not conclusive—evidence that an agent can deliberately affect from a distance an attuned recipient so that the latter is often able to tell on what the former concentrated.' Assenting to this are Sidgwick, James, Forel, Freud, Bergson and Driesch.

Now, naturally, from the simple test of one person reading a simple thought of another to the full and free exchange of mental ideas by telepathy exists a wide gap. But such a gap existed between the first crude radio transmitter and the powerful broadcasters we have today. The development of mental telepathy in our opinion is dependent on the development of powerful minds that can send messages, and sensitive minds that can receive them. These requirements are no different than those for good radio reception. Now whether mental telepathy ever develops to a respectable stage or whether such development comes in 100 or 500 years, does not primarily concern us. We are chiefly interested in the question, "Is there a scientific basis for telepathy?" Our answer is "yes."

However, we are willing to throw our columns open to discussion from our readers, pro and con.—*Editor*)

John Taine In Profile

Editor, WONDER STORIES:

Am now engrossed with the June issue, and just *must* make something of the illustration by Paul for John Bertin's yarn, "Brood of Helios." The face on the side of the mountain (I haven't read this installment, so it might not be a mountain. I'm saying this because the rabid readers of your magazine might delight in pouncing upon me if they detect what is apparently a discrepancy in my criticism), was familiar.

If you but look closely at the face sculptured on the face of the supposed mountain, it will be observed that it is almost an exact replica of John Taine; in profile, of course. I know not whether other readers have commented on this fact, but it struck me as rather odd. Readers of WONDER STORIES, what do you think!

While I'm typing this letter I might as well record my impression of the fiction contained in the June issue. This is my first offering to "The Reader Speaks," so look kindly on all criticisms which are forthcoming.

"The Hell Planet," by Miss Stone, was unimpeachable. It is the second work of hers which I have had the pleasure of reading, and I enjoyed it immensely. The plot, contrary to the footnote, wasn't so original, and yet the tale flowed along smoothly. More by feminine authors would be appreciated.

Walter Kateley's "Under Arctic Ice" was the least interesting story in this issue. Surely Mr. Kateley, of whom I had heard so much that I expected his story to be a classic, can do better. Ah, well, his first effort for "our" mag. was much better than some stories by regular authors.

Mr. Smith's reputation was upheld by "The Invisible City." It was much better than "The Eternal World." The latter was the most insane riot of superfluous verbiage that Mr. Smith could possibly have attempted. That, however, was unusual for Clark, yet too much might spoil the "rep" of this otherwise deserving author.

Fred C. Miles,
New Providence, N. J.

(We don't suppose that John Taine would object to his resemblance to the father of his country. However, according to Paul, there was no attempt made at a similarity. But no doubt, some of our readers can find scientific reasons for the similarity in the faces of two great men. Try it anyway, it might be a pleasant occupation.—*Editor*)

Re- "The Conquest of Space"

Editor, WONDER STORIES

In the June issue of WONDER STORIES there was a letter from Norman Maguire. In answering the letter you mentioned the book, "The Conquest of Space" by David Lasser of the American Interplanetary Society.

Will you please tell me who publishes the book, what is the price and how I can obtain it?

Byron Christman,
Howe Caverns, Cobleskill,
New York.

("The Conquest of Space" is published by the Penguin Press, 93 Christopher St., New York, and we suggest that you write to them. The retail price of the book is $3.00 but we have been informed that readers of WONDER STORIES can obtain it for $2.00 by mentioning that fact.

The book has now been taken up in England and has been recently published there by Messrs. Hurst and Blackett. We understand also that negotiations are under way for translation of the book into French and German.—*Editor*)

ON LETTERS

BECAUSE of the large number of letters we receive, we find it physically impossible to print them all in full. May we request our correspondents, therefore, to make their letters as brief and to the point as they can; as this will aid in their selection for publication? Whenever possible, we will print the letter in full, but in some cases, when lack of space prohibits publishing the complete letter, we will give a resume of it in a single paragraph.

Obstacles to Space Flying

Editor, WONDER STORIES.

In your June number there is some correspondence about the obstacles to space flying, it seems to me that there is still something to be added.

(1) The propulsion of a space ship is not so much a matter of energy as of momentum. By Newton's Laws of Motion, affected only infinitesimally by Einstein's Theory, a body or system of bodies in space can have its total momentum altered only by the action of an external force. In space there is nothing to push against and the only forces acting are the gravitational attractions of the surrounding bodies which will be small and are not likely to produce a resultant in the direction required; if gravitation be neglected there is nothing acting on the body or system to change its total momentum, and so the velocity of its centre of gravity must remain constant.

The only thing possible is to shoot off part of the *mass* of the ship in a direction opposite to that in which the change of velocity is desired. The total momentum, found by adding up all its components in the manner usual for all vector quantities must be unchanged, hence if a piece of the mass is shot out in one direction the remainder will gain equal momentum in the opposite direction. Now momentum is mass multiplied by velocity, so that if a small piece is shot out backwards with a great velocity the larger mass will gain a much smaller velocity forwards. For example if one pound of matter is shot out backwards with a velocity of 100,000 miles per hour the remaining piece if its mass is 100,000 pounds will gain a velocity of 1 mile per hour.

Hence a rocket ship must constantly lose mass backwards and the situation is not improved if energy is available above a certain amount for there would be limits to the possible force of the explosion in the strength of the cylinder long before a velocity in the mass shot backwards equal to that of light is reached.

Although in space there would be no frictional loss yet considering the need for acceleration and retardation as well as of changing direction and opposing the force of gravitation when near to a heavenly body, it is difficult to see how a space ship could carry weight enough of explosive to supply the necessary loss of mass for any considerable journey. The cal-

The Greatest Sin of all is total IGNORANCE of the most important subject in the life of every man and woman—SEX.

Away With False Modesty!

Let us face the facts of sex fearlessly and frankly, sincerely and scientifically. Let us tear the veil of shame and mystery from sex and build the future of the race on a new knowledge of all the facts of sex as they are laid bare in plain, daring but wholesome words, and frank pictures in the huge new library of Sex Knowledge.

"MODERN EUGENICS"

544 Pages of SECRETS

Everything a Married Woman Should Know—

How to hold a husband
How to have perfect children
How to preserve youth
Warding off other women
Keeping yourself attractive
Why husbands tire of wives
Dreadful diseases due to ignorance
Diseases of women
Babies and birth control
Twilight sleep—easy childbirth
How babies are conceived
Diseases of children
Family health guide
Change of life—hygiene
Why children die young
Inherited traits and diseases
What will you tell your growing girl?
The mystery of twins
Hundreds of valuable remedies

Secrets for Men—

Mistakes of early marriage
Secrets of fascination
Joys of perfect mating
How to make women love you
Bringing up healthy children
Fevers and contagious diseases
Accidents and emergencies
Hygiene in the home
Limitation of offspring
The sexual embrace
Warning to young men
Secrets of greater delight
Dangerous diseases
Secrets of sex attraction
Hygienic precautions
Anatomy and physiology
The reproductive organs
What every woman wants
Education of the family
Sex health and prevention

Girls— Don't Marry

Before you know all this—

The danger of petting
How to be a vamp
How to manage the honeymoon
What liberties to allow a lover
Secrets of the wedding night
Beauty diets and baths
Do you know—
How to attract desirable men
How to manage men
How to know if he loves you
How to acquire bodily grace and beauty
How to beautify form, hands, hair, teeth and feet
How to acquire charm
How to dress attractively
Intimate personal hygiene
How to pick a husband

IMPORTANT!
This work will not be sold to minors.
When ordering your book state your age.

Grosvart Company
245 Greenwich St.
Dept. WS 832
New York, N. Y.

Please send me "Modern Eugenics" SEALED in plain wrapper. I am sending you $1.98 in accordance with your special half price offer

My age is .....
Name .....
Address .....
City and State .....

THE READER SPEAKS

calculations that have been made for a journey to the moon have shown a loss of mass equal to a very large percentage of the initial mass.

(2) Many writers seem to think that the earth's atmosphere ceases suddenly instead of thinning off gradually. Nor do they realize that according to the kinetic theory of gases it is the intensity of the gravitation that determines whether a body can hold an atmosphere. The small mass of the moon makes it impossible for it to hold an atmosphere except perhaps a little heavy carbon dioxide, and smaller satellites must be still less able to hold an atmosphere.

(3) Also some seem to think that the gravitational attraction of a heavenly body ceases suddenly at a certain distance. According to Newton's Law every particle in the Universe attracts every other particle with a force proportional to the product of their masses and inversely proportional to the distance between them. It is the sun's attraction which keeps the earth and other planets in attendance on it instead of running off into space.

(4) There is some confusion between gravitation and magnetism. That they are both attractions does not necessarily mean that they are in any way related and no connection has yet been found. Gravitation seems to be a property inherent in matter and no means have been found to alter it in the slightest degree. If it were possible to change the direction of gravity at any place, except by the attraction of matter, it would be possible to make water run uphill and a continuous generation of energy, or perpetual motion, would be possible.

(5) There seems to be a little confusion in the minds of writers between acceleration and velocity.

(6) Lastly, we have no idea what may be the effect on the "empty" space of the exceedingly penetrating "cosmic" rays discovered by Millikan; the effect on the passengers in a space ship of these rays, when outside the protective atmospheric layer might be disastrous.

I am much interested in the stories you publish and admire the power of imagination shown by your writers. I consider that you are doing a great service in encouraging imagination in these days when the tendency is to make us all cogs in a machine and so, to destroy all personal initiative and with it all inventive power.

R. H. Cole,
Palma, Majorca, Spain.

(Mr. Cole's analysis of some of the obstacles to space flying are well founded. They were not included in the list published in WONDER STORIES, for it was assumed that the questions referred to the obstacles that would remain after the fuel problem had been settled.

Our belief is that no tremendous acceleration, such as Mr. Cole hints at, would be required or even desirable. A steady acceleration of 3 times gravity, or about 100 feet per second, would be adequate for a trip to the moon, or even to Mars or Venus. For in any case the main problem is to get the space ship out of the gravitational influence of the earth. This is accomplished when a speed away from the earth of 6.664 miles a second is attained. Then the earth can never pull the ship back to it.

With the acceleration given above, it would take about 9 minutes to achieve the required speed, and at the end of that time the ship would be about 1200 miles above the earth, well out of its atmospheric belt.—*Editor*)

Not Undignified

Editor, WONDER STORIES:

I do not think your covers are wild and undignified. On the contrary they are colorful and attractive. They are more likely to attract new readers than the covers of the July issue. Please do not discontinue them.

Ever since WONDER STORIES changed back to the large size there has been a decided improvement in the quality of the stories published. Also an improvement in the illustrations—thanks to Paul!

"Brood of Helios" I hope to see in book form. So realistic was it that the reader can hardly help wondering whether it is just fiction. "The Time Conqueror" is one of the most interesting

(*Continued on page* 380)

3 Valuable NEW BOOKS

Formulas and Recipes
Radio — Mathematics

Presented here are three brand new books, of diversified nature, which are educational and instructive. Each book carefully treats a subject in full, and is prepared by an expert in the field. The books are well written and thoroughly illustrated to make the contents easily understandable. Get these books promptly—mail coupon below.

1 FORMULAS AND RECIPES for the Practical Man

This book has been compiled by H. Gernsback, a well-known author of practical instructional manuals in various scientific fields. It is extremely helpful and will show you how to save money by making in your own home, at a fraction of the regular cost, the hundreds and one preparations which you now buy for use at home or business.

HERE ARE PARTIAL CONTENTS

1. Adhesives: Glues, Cements. 2. Cleansing: Stain Removers, Bleaches. 3. Metal Craft Compounds: Oxidizing, Plating, Polishes. 4. Paints, Oils, Stains, Varnishes. 5. Glass Working: Cutting, Drilling, Boring, Etching, Engraving. 6. Wood Craft: Impregnating, Fireproofing, Waterproofing, Furniture Polishes. 7. Inks: Sympathetic, Invisible, Hectograph. 8. Photography: Developers, Emulsions, Fixers. 9. Antidotes for Poisons, Remedies for Burns and Scalds. Disinfectants. 10. Preparation, Manipulation, Handling, Mixing. Tables of Weights and Measures, Useful Tables.

2. FUNDAMENTAL PRINCIPLES OF RADIO
Radio Simply Explained—Its Origin, Nature and Functions

The book, written by Louis Martin, has been prepared with special consideration given to young men who are in the radio professions, and those who have gained their experience in a haphazard fashion. This radio primer is a handy fundamental aid for "checking up" and systematizing your knowledge of radio. Regardless of how much you know about the subject, you should read this book.

HERE ARE PARTIAL CONTENTS

Chapter I—Fundamentals of Radio: Electricity, Resistance, Batteries. The Magnetic Circuit. The Magnetic Field. Inductance. Condensers. A.C. Electricity. Propagation of Radio Waves. Chapter II—The Simple Radio Set. Single, Two, and Three Circuit Tubes. The Battery Set. Vacuum Tubes. Electric Sets. Loud Speakers. Chapter III—Diagrams, How to Read Them. Chapter IV—Amateurs and Broadcast Stations. Talking Pictures, Television.

3. ELEMENTARY MATHEMATICS for the Technician and Craftsman

This manual has been especially prepared for the man who wishes to acquire a working knowledge of the elementary principles of mathematics. A complete treatment of the subject is given by the author. Mr. C. Hausmann with special attention to the use of mathematics in Radio and other technical work for those who employ its formulas daily.

HERE ARE PARTIAL CONTENTS

I—Arithmetic: Addition, Multiplication, Subtraction, Division. How to Use Decimals. II—Fractions. Percentages, Ratio and Proportion. III Powers and Roots. IV—The Metric System. V How to Measure Surfaces and Volumes. VI Mathematics for the Manual and Technical Craftsman. VII Special Mathematics for the Radio Technician. VIII Commercial Calculations. Short-cut Arithmetic. Interest Calculation. Discounts. IX Weights and Measures. X Useful Tables.

All my books are of uniform size, 6 x 9 inches, and contain 96 pages. The books are printed on strong paper with stiff, colored covers.

Clip and Mail Coupon TODAY!

PRESS GUILD INC., 96 Murray St., New York City
WS 9

Enclosed find $_____. For which send me postpaid the following books:

No. 1 [ ]
No. 2 [ ] 50c each, Postpaid
No. 3 [ ]

Name _____

Address _____

City and State _____

The Breakers
ATLANTIC CITY, NEW JERSEY
On the Boardwalk

Under New Management

FEATURES NEW LOW RATE LEVELS FOR BOARD-WALK ACCOMMODATIONS
LUXURY AND ECONOMY COMBINED

Per Day $5.00 Per Person
with Meals
and
Hot and Cold Sea Water Bath

Concert Orchestra — French Cuisine
Cabaret — Dancing — Refreshments
Each Week-End — Complimentary to Guests

Emanuel E. Katz,
Managing Director

READ 2 MAGAZINES FOR THE PRICE OF ONE

PATHFINDER and RADIO - CRAFT

Here is your opportunity to read two magazines for one year—at the cost of only one. Two real live magazines that afford many hours of reading pleasure. One in the radio field, the other, a weekly of big news events.

The PATHFINDER, a Weekly, devoted to the important news items of the day—flashes from all parts of the world are brought to you in a concise, but interesting manner. Every page holds interest by prominence of well-written editorials. Also book reviews, national politics, foreign affairs, business, education, science, movies, personalities and dozens of other features.

RADIO-CRAFT, a monthly radio magazine devoted to helping men make money out of this big industry, by teaching them how to properly service receivers, do odd jobs in the radio business and bring to them the new developments in this field. Each issue brings new advances in television, short waves and other allied divisions of radio.

The regularly yearly subscription price for RADIO-CRAFT alone is $2.50. For a limited time only, both magazines will be sent to you for the price of one—$2.50. Fifty-two issues of the PATHFINDER and twelve issues of RADIO-CRAFT. Mail remittance in form of check, stamps or money order.

RADIO-CRAFT Magazine

9WS PARK PLACE NEW YORK, N. Y.

"The Gathering Place of Cosmopolitan New Yorkers."

THE RUSSIAN VILLAGE
100 West 57th Street
New York City
Dining, Dancing, Russian and Gypsy Entertainment.
LUNCH—TEA—DINNER
No cover charge at any time.
Broadcasting WOR Circle 7-9434

THE READER SPEAKS

(*Continued from page 379*)

novelettes ever published. L. A. Eshbach is to be complimented on his vivid imagination and realism.

Otfrid von Hanstein's stories read as though he had a time machine in which to travel into the future to see what it is like, before he begins to write. They are much more plausible than are other science fiction tales I have read. One wonders why such inventions are not already in use.

I enjoyed the Summer issue of the QUARTERLY very much.

I did not care for the six books of the new Science Fiction Series. I would prefer that you discontinue this series and publish more science fiction classics instead.

I like the new make up of WONDER STORIES. It's modern. I hope you will keep on using thin paper, whether it is pulp or machine finished. I prefer the latter, or egg shell paper.

Paul's cover is a masterpiece of science-fiction illustrations. The black background is something different for a change. His drawings inside are also very good.

The stories in the August issue are good examples of science fiction.

"In the Year 8000" is my choice for first place. This is closely followed by "Tyrant of the Red World", "The Space Coffin", "The Platinum Planets", and "Flight Into Super Time."

How about some stories in which chemistry is the background? A. Hyatt Verrill with South American stories would also be welcome.

Jack Darrow,
Chicago, Ill.

(We did not believe our covers to be undignified, but certain of our readers did. We wished to give them a chance to judge a new type of cover, as well as participate in an exciting contest. The interest in it has been so great that we have used the same principle on the September cover. Contest fans, just freed from racking their brains over one, will find themselves drawn into this new contest.—*Editor*)

Editor, WONDER STORIES:

Why the Heavens Fell

A number of our readers have commented upon E. T. Snook's "Why the Heavens Fell," mostly in approval. But I for one thought it was terrible. The story, I admit, was written in a pleasing manner, but when the author injected the expression, "like the laboratories of all fictional scientists,"—well, that's what ruined the story for me.

I like to imagine that what I read is true, while I'm reading it, but I couldn't do that with the writer constantly reminding me in one way or another that it was all fiction. And as I continued reading to the end (being rather bored) and saw what the writer's idea was, I was shocked!

Yes, that is the word, shocked! To think that the author rated our intelligence so low as to assume that we would believe that by repealing a Universal Law such as the "Law of Inverse Squares" in Congress that the law would become non-existent.

Honestly I don't know who to blame—the writer, yourself or me. I'll admit I don't know much science, but I can't bring myself to believe that a universal law may be repealed in a court, and the results occur such as pictured in "Why the Heavens Fell." Can you enlighten me?

I must congratulate you on the June issue, especially on "The Hell Planet." This was an excellent piece of work. I am sure all of our readers would like to have more of Leslie F. Stone's work. Clark Ashton Smith scored again with his vivid descriptions and unusual plot in "The Invisible City."

"The Message from Mars" was just what I had been waiting for, and shows that an Englishman can write just as good science fiction as Americans.

"Under Arctic Ice" was interesting with its theory of how a race could establish itself in the arctic ice caps. "The Power Satellite" was an excellent yarn, coming as it did from R. F. Starzl's pen. I am anxiously waiting for the July issue to finish "Brood of Helios." But who isn't?

Carl Johnson,
Danville, Va.

(Since this question of Dr. Snook's intentions was of such widespread interest, we have asked the great author himself to write a few words about "Why the Heavens Fell." Incidentally we might state that Dr Snooks is not Hugo Gernsback; neither is he Lon Chaney. Dr. Snooks wrote us, from his distant home, as follows, "Being confronted by the editors with the above indictment of a crime against all ethics of science fiction, I plead *non vult contendere*. As originally drafted, 'Why the Heavens Fell' was a study in psychology instead of physics; and it had a happy ending. The narrator awoke with the sun shining in his face, to find that it was all a dream. This may explain certain lapses from probability in the action of the story. The impulse for a sudden dramatic ending, without an anti-climax, prevailed among the editors of WONDER STORIES: '*Ars fiat vust custum.*' However, while the powers of Congress are more limited, we know that a Constitutional Amendment is omnipotent and overrules the laws of Nature herself. I leave Mr. Johnson to argue this matter of legality with the Supreme Court."

With these profound words, Dr. Snooks lapsed again into his customary silence, which will be broken, we hope, by another story in the near future. And, as Dr. Snooks would say, '*Ars fat, rwat castum*', and, if you don't like that, you may have some *non vult contendere*.—*Editor*)

THE READER SPEAKS

Universal Goes On

Editor, WONDER STORIES

It was with great pleasure indeed, that I noticed the advertisement for the six new Science Fiction books. I could hardly wait to get my order in the mail. Lately I have had the first twelve books bound in book form, and now I can have another book made. That is, when you publish still ANOTHER set of six books. So keep it up. Add more and more pamphlets to the series. See how long it will take you to publish SCIENCE FICTION SERIES NUMBER 100. That will make quite a library, won't it!

Where, oh where did you get the *SPLENDID* stories that you printed this month! Every one was perfect! And what do we all think of "Brood of Helios!" Ask us! I'll say this . . . It's the most thrilling story since "Exiles of the Moon." And that's saying plenty, because "Exiles of the Moon" is a story that's hard to beat.

Oh! boy, what an author! I mean the one whose face reminds one of Marco Polo. Namely, Eppy Snooks, D.T.G. (By the way, it isn't at all possible that the editor himself wrote the story, is it!) Anyway, the author of "Why the Heavens Fell" certainly must have gotten hold of some of Miles J. Breuer's famous Buried Treasure. What a story! I mean that it was good! And plenty good. In illustrating the story, Paul certainly brought back to the minds of many readers, thoughts of Doc Hackensaw. If you ever bring back reprints, first give us the Hackensaw series.

And that reminds me, will you or will you not give us that big page telling us all about Paul!

Hey ! ! ! You haven't given us a contest for a couple of years! Let's have one. There are contests galore that you could spill to the science fiction fans. Story contests, emblem contests, picture contests, question and answer contests, and so on down the line. Give us any kind, but let's have one SOON!

We see by the papers that UNIVERSAL is making a long string of science fiction photoplays. (Well, all right. Two then!) "Automaton" and "Invisible Man." But there is a lack of something in both stories. Something that stands out like a vacuum. (!) That is . . . The Stories Take Place On Earth. By this time, we feel that a story is not a complete science fiction tale unless it has the old space rocket plot. And to make a movie complete, we must see in it, scenes of the distant future. "Automaten" may have this, but, if "Invisible Man" is to be filmed according to the story, we know that the only scientific scene we will find in the show, is where the man, with his chemicals, makes himself transparent. How I long for a reissue of Ufa's "Metropolis!" How I long to see that show again. I saw it six years ago, but time can't take those scenes out of my mind. The cities of the future, the workers and aristocrats, the wonderful laboratory of the mad scientist, and the experiment of TURNING AN IMAGE OF METAL INTO THE LIKENESS OF A YOUNG WOMAN! Truly a masterpiece of motion picture reproduction and direction.

Who can forget "Mysterious Island!" The play was a butchering of the original story, but who cared. It was better than the book. The finding of the two-legged creatures at the bottom of the ocean put crowds of people to thinking.

And wasn't "Mystery of Life" a science fiction production! Even though based on fact it seemed fantastic. The beginning and end of the world brought before your eyes!

I am glad that I no longer have to envy those people who have been lucky enough to see "The Girl in the Moon."

Now, will the great science fiction campaign have any effect on the producers! Let's cross our fingers and wait. And hope.

Leslie Stone can always dish out good stories. You can always be sure that one of her stories will interest you. I guess that it's because the woman haven't used up all their plots thus far.

And as a parting shot, I'll tell the world that one of our favorite editor's stories wouldn't hurt the magazine once in a while.

By the way, how about the series of scientific short subjects that UNIVERSAL plan to produce, starring the well known scientists of the world! Are they actually going to make them! (Their purpose will be to bring all of the tough problems of science down to the level of the average person, and this will be done by actual trips "to the stars" etc. Wait'll they get the fourth dimension idea in all the people's minds!) I read about this project in an Omaha newspaper.

Joe Kucera,
Omaha, Nebraska.

(The Universal Film Company is to be congratulated on its daring to film some of the science fiction masterpieces. We have recently written to the large film companies and announced the completion of our petition, and have requested a statement of their attitude on science films. As soon as we have heard from all of the companies a resume will be published in WONDER STORIES.—*Editor*)

Some Scientists Cannot Find Out

Editor, WONDER STORIES

With regard to Mr. McCrae's letter in the August issue of WONDER STORIES commenting on the mechanism of heredity in my story "The Last Woman."

In the determination of sex in man the best authority in America is Dr. T. H. Morgan of the Univ. of Southern California. A summary of the inheritance of sex according to Dr. Morgan is as follows

The unfertile female sex cell in man has forty-eight chromosomes before reduction. After reduction-division each fertile egg has twenty-four chromosomes, one of the twenty-four in each case being what is called the sex chromosome X. The male sex cell before reduction division has forty-seven chromosomes and one non-gene bearing chromosome or the Y chromosome. The Y chromosome is very much smaller than the others and does not carry genes giving rise to the sex-linkage in heredity.

After reduction-division there are two types of fertile spermatozoa. One containing twenty-four chromosomes of which one is an X, the other twenty-three chromosomes and one non-gene bearing chromosome, the Y chromosome making a total of twenty-four in each case. If the former sperm unites with an egg, a female is produced, the fertilized egg or zygote containing forty-eight chromosomes in which are the double XX. However, if the latter sperm, the one with the Y chromosome unites with a fertile egg, the zygote contains forty-seven gene bearing chromosomes and one non-gene bearing Y chromosome, making forty-eight also.

Due to the fact that the female zygote contains forty-eight gene-bearing chromosomes and the male only forty-seven, (i.e. female XX, Male X) many writers neglect the presence of the Y chromosome.

In some plants and animals the Y chromosome *is* absent.

American authorities generally agree that the Y is present. I believe that photographic evidence support this claim. It is only fair to say that some European scientists claim they cannot find it.

I hope that this has cleared up the point at issue and realise that I probably did not make the explanation as clear as I might have.

I certainly appreciate Mr. McCrae bringing it up and will be very glad to bring scientific evidence of any other point that seems vague. Much is buried deep in technical works and scientific reports—of course being a fiction story the imagination wound all together.

Thos. S. Gardner,
Johnson City, Tenn.

(Discussion never hurts any cause, as this letter proves. We all understand the mechanism of heredity better now, and a point at issue has been cleared up. We might offer some cheers for free speech.—*Editor*)

An Englishman Protests

Editor, WONDER STORIES:

After several attempts at writing I have at last managed to get together a few words of appreciation for WONDER STORIES. All of the stories are not good. But there are more good

QUIT TOBACCO

No man or woman can escape the harmful effects of tobacco. Don't try to banish unaided the hold tobacco has upon you. Join the thousands of inveterate tobacco users that have found it easy to quit with the aid of the Keeley Treatment.

KEELEY Treatment For Tobacco Habit Successful For Over 50 Years

Quickly banishes all craving for tobacco. Write today for Free Book telling how to quickly Free yourself from the tobacco habit and our Money Back Guarantee.

KEELEY INSTITUTE, Dept. B 701 Dwight, Ill.
Home of the Famous Keeley Treatment for Liquor and Drug Addiction now in request. Correspondence strictly confidential.

CLASSIFIED ADVERTISEMENTS

Advertisements in this section are inserted at the cost of ten cents per word for each insertion. Name, initial and address each count as one word. Cash should accompany all classified advertisements unless placed by a recognized advertising agency. No less than ten words are accepted. Advertising for October, 1932, issue should be received not later than August 7th.

CHEMISTRY

BECOME TRAINED CHEMIST. Thousands of opportunities—fascinating career. Learn at home. Complete experimental laboratory outfit given. Write for big free book. Chemical Institute, 19 Park Place, Dept. WS, New York.

MISCELLANEOUS

IF YOU WANT TO MAKE NEW FRIENDS by mail, or go into business. We furnish mailing lists of all descriptions. Write for free lists. Box 100-AD, Fremont, Ohio.

$5,000 ANYONE WHO WILL BE PAID TO PROVES THAT THIS

is not the actual photo of myself showing my superb physique and how the Ross System has increased my own height to 6 ft. 3½ inches. Hundreds of Testimonials Clients up to 45 years old gain 1 to 3 in. in few weeks. No appliances. No drugs. No dieting. Ross System Never Fails. Fee Ten Dollars Complete. Convincing Testimony and particulars 5 cent stamp. Allow time for return mails across the Atlantic.

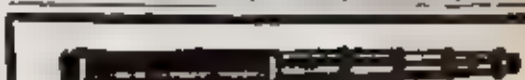
C. MALCOLM ROSS, Height Specialist
Scarborough, England (P. O. Box 18)

Book Lovers Ex-Libris Book Plates

LATEST series of OLD MASTERS book-plates, reproducing antique woodcuts and engravings. Unique creations for book lovers who appreciate the unusual. Write for illustrated catalogue and specimens, sending 10 cents to cover mailing charges.

WRITE FOR CATALOGUE

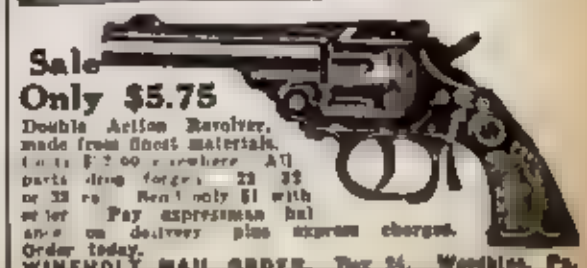
INACE PRESS, INC., 15 Park Place, Dept. A-832, New York, N. Y.



BIG 3ft. TELESCOPE 3 sections, Brass bound. 10-mile Range. Sturdy Tripod.

Moon, Stars and distant objects with this powerful 3 ft. instrument. Special Eye piece for viewing Sun included FREE. Makes an ideal Microscope. Guaranteed. Big value. Postpaid $1.75. C.O.D. 15c extra.

BENNER & COMPANY, T-76, TRENTON, N. J.



Sale Only $5.75

Double Action Revolver, made from finest materials. Cost $12.00 elsewhere. All parts drop forged. 22 32 or 38 cal. Send only $1 with order. Pay expressman balance on delivery plus express charges. Order today.

WINENOLY MAIL ORDER, Box 34, Woodbine, Pa.

SECRET SERVICE

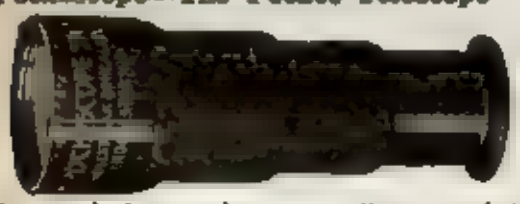
We Want Men And Women Of Average School education, gifted with common sense to study Secret Service and Scientific Crime Detection. If you like this class and interested write Joseph A. Kavanagh Former Agent U. S. Secret Service Operator, International Secret Service Institute, Dept. WSS-1 65 Hudson St., Hoboken, N. J.

Enjoy the Wonders of Nature with an

Extra Powerful MICROSCOPE or BINOCULARS

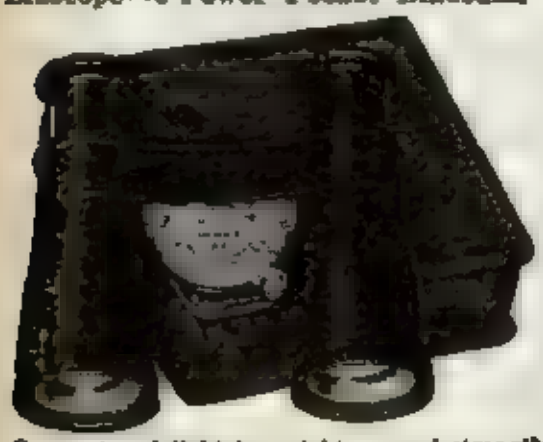
This season you can enjoy outdoor sports by carrying with you a handy pair of pocket binoculars . . or facilitate your laboratory work by using a microscope of more powerful design. Or you can even keep in your pocket a small telescope which will often come in handy.

Pocketscope—The Pocket Telescope



Not much larger than an ordinary pocket knife and yet it is a wonderfully powerful telescope. Easily focused and capable of enlarging a view many times. Finished in black crystallized lacquer with nickel trimming. Each instrument supplied with leather case. 6 Power, Length closed 3¼", Diam. 1-3/16". Price $2.00; 8 Power Length closed 2⅝", Diam. 11/16". Price $3.00.

Biascope—6-Power Pocket Binocular



Compact and light in weight, rugged strength for long use. Focusing device permits accurate adjustment. Furnished with genuine ostrich grain leather case. Excellent for athletic events, motoring, theatre, hunting and camping. Model illustrated, object lens 1" Diam., height extended 3-9/16". Price $5.00.

110-Power Microscope

The convenient size, simple manipulation and precise optical qualities of these Microscopes will appeal to biologists, chemists, geologists, dentists, physicians, laboratory workers and experimenters. Detachable base permits examining large and small objects. Single achromatic lenses, magnifies 50X, 75X, 100X and 110X. non-tilting stand. Height extended 8½". Chromium and black lacquer finish. Price complete with case, $10.00.

To order, simply fill in coupon completely and send remittance for full amount in check or money order. Goods will be delivered promptly. Include sufficient postage to insure safe delivery any excess will be refunded.

CLIP COUPON AND MAIL!

GRENPARK COMPANY WS-932
245 Greenwich Street, New York, N. Y.
Enclosed find my remittance for the amount of $ for which you are to send me the articles checked below. I understand these products to be perfect.

POCKET TELESCOPE [ ] Large size $2.00 [ ] Small size $1.00
[ ] BIASCOPE BINOCULARS. $5.00.
[ ] 110 POWER MICROSCOPE. $10.00.

Name _____
Address _____
City _____ State _____

THE READER SPEAKS

(Continued from page 381)

than bad. One of the bad stories made its appearance in the June issue—"The Message from Mars." This may sound strange, coming from England as the story was all about England saving the world. The theme of the story was not so bad but Mr. Stranger made a very crude effort to put England on the map.

An American author would have been more subtle. I expect a few brickbats from English readers for writing this. But it is my opinion on "The Message from Mars."

I think the best story was "The Hell Planet" by Leslie F. Stone. It gave a real picture of how the space fliers of the future may fare on other worlds. There may have been flaws in the story, but I saw none of importance. The other stories I place as follows: 1. "The Power Satellite"; 2. "The Invisible City"; 3. "Under Arctic Ice." I did not read the serial yet.

A. Hulme,
Ashton-Under-Lyne,
Lanc., England.

(It is quite refreshing to find a man objecting to chauvinism even if it reflects credit on his own country. Too many American authors picture their heroes as being exclusively American; and all important world action as emanating from America. We believe that a broader viewpoint in the future will eliminate this tendency.—*Editor*)

WHAT IS YOUR SCIENCE KNOWLEDGE?

1. What are the properties of natural steel alloys? (Page 296)
2. What are the "inherited characteristics" of metals? (Page 300)
3. What is the greatest necessity in digging a deep subterranean tunnel? (Page 301)
4. For how long are Pluto and Neptune in approximate conjunction? (Page 311)
5. What is the effect of cosmic rays on gases? (Page 313)
6. What is the effect of ionized gases on radio waves? (Page 312)
7. What is supposed to be the nature of suspended animation? (Page 315)
8. What would be a good chemical mixture to use to detect the landing of an unmanned rocket on the moon? (Page 321)
9. What is a good rocket fuel combination? (Page 322)
10. What is the most terrible psychological danger of a long journey through space? Page 322)

SCIENCE QUESTIONS AND ANSWERS

(Continued from page 376)

equivalent to a frequency of 15 kilocycles, (wavelength 20 miles) the radio reception improves in direct relation to sun-spot activity.

There is still much that remains to be discovered about sun-spots, and it is probable that in the future more interesting effects upon our lives will be discovered. Some imaginative statisticians have associated sun-spots activity with the fluctuations in stock market activity and the growth of rabbits.—Editor)

Telling the Earth's Age

Editor, Science Questions and Answers:

I have heard quite a bit about the method of telling the age of the earth by radium. Will you please explain, and tell what the latest estimate of the earth's age is?

(The "radium clock" as a method of determining the age of the earth is based upon the spontaneous decomposition of uranium into radium, and radium into lead. This process goes on at a perfectly definite rate, and nothing that we have been able to discover has been able to accelerate or to retard this process.

We know for example that the average life of a piece of uranium is two billion years. In given samples of uranium that we find there is always some radium and lead mixed in it. By determining the percentage of lead and radium, we can work backward to see how long the sample must have been decomposing in order to reach that state.

From investigations that have been made, the "oldest" uranium and radium ores that have been found point to their being pure some 1,500,000,000 to 2,000,000,000 years ago. This estimate therefore has been accepted as the probable age of the earth. Naturally as more discoveries are made of such ores, the estimates will tend to approach more and more closely to a definite figure.

The radium clock method supplants the older and more inaccurate method of determining the age of the earth by sedimentary deposits. The accepted age of the earth has been greatly increased by the change.—Editor)

BOOK REVIEWS

THE OPEN WORLD by Dr. Hermann Weyl, 86 pages, stiff cloth covers. Size 5¼ x 8. Published by Yale University Press. New Haven. Price $1.50.

Dr. Weyl who is a distinguished German mathematician, discusses in this book, which is a reprint of a series of lectures delivered at Yale University, the questions of God and the Universe, Causality, and Infinity. His thesis is that "recent advances in mathematics and physics, insofar as they are known to me through my own scientific work, makes the universe appear more and more as open one in the sense of pointing to something beyond." He believes that "the completed infinite we can only represent in symbols. From this relationship every creative act of man receives its deep consecration and dignity. But only in mathematics and physics, so far as I can see, has symbolical theoretical construction acquired sufficient solidity to be convincing to everyone whose open mind is open to these sciences."

For those who are interested in the approach of a distinguished mathematician to God this book is recommended.

WILD TALENTS by Charles Fort, 343 pages, stiff cloth covers. Size 6 x 8⅛. Published by Claude Kendall, New York. Price $3.00.

The late Charles Fort became well known for his books crammed with facts of nature that science refused or could not explain. His "Book of the Damned" in particular established the cult of Forteans who believed that there was something "behind the veil" that caused rains of blood from the heavens, etc. etc.

In his present book he turns to a study of the "wild talents" of human beings that enable them to perform tricks of strength, skill beyond what should be humanly possible. These wild talents, he says, when controlled will bring in a new era of witchcraft and sorcery in the future.

Fort sees all about us, strange powers causing people to collapse on the street, die suddenly of strange maladies; to be murdered in particular places, etc. etc. The book is not only interesting but fascinating, for the incidents mentioned by the author are actual newspaper accounts of these "strange doings."

CAMERA SECRETS OF HOLLYWOOD by Robert C. Bruce and Pat Dowling. 134 pages, illustrated, smooth paper covers. Size 6¼ x 9½. Published by Camera Secrets Publishing Co., Hollywood. Price $1.25.

This book is not, as might be thought, a series of Hollywood scandals, but rather a book for the camera enthusiast, showing him what possibilities there are in photography. The book is profusely illustrated with photographs taken in and about Hollywood, many having some relationship to the movie colony therein.

The book analyses both photographs and movie films, shows how to get a good shot, how to take it, the "composition" of photographs, what to leave in or leave out, and even includes chapters on "films for profit." The book, in other words, attempts to work out a science of picture taking.

. . . . where thousands look to find latest science news, constructional articles for home work-shop and money-making ideas . . . .

25c The Copy

Over 450 Illustrations
96 pages—
4-Color Cover
9 x 12 Inches

Partial Contents of the Current Issue

Refrigerated Houses
A Hundred Years Hence
The Birth of the World
The Eclipse of August 18
The Wealth in the Ocean
The Tube that Weighs the Earth
Artificial "Northern Lights"
Frozen Light
New Airplane Designs
The Rocket Automobile
Science Makes It Possible
Ultra-Violet Light Detects Fraud
The Wonders of the Eye
Latest Scienti-Mechanical Devices
Trick Photographs and Odd Assemblies
Old Auto Parts Prize Contest
Cigar Boxcraft Prize Contest
Amateur Woodworker's Course
Modernistic Bookcase from Old Boxes
The Cigarette Golfer—A Novelty
A Stationery Cabinet
A Postcard Projector
A Wood-Turning Lathe from Pipe Fittings
Secret Locks—Part II
Building the Catboat "Swallow"
Make Your Own Portable Refrigerator
A Tail-First Plane Model
Money from Old Bottles
Toys from Tin Cans
A Wrought-Iron Fireplace Grate
Auto Hints
Shop Hints
New Tools You Can Make
Handy Helps About the House
Wrinkles, Recipes and Formulas
New Radio Devices
The Short-Wave Megadyne
Radio Wrinkles
Building an Audio Amplifier
Automobile Radio Hints
Radio and Television Progress
High-Frequency Experiments.

WE DO not hesitate to say that EVERYDAY SCIENCE AND MECHANICS is the finest *scientific-technical-mechanical-constructional* magazine in the field. Right up-to-the-minute with news flashes of scientific events from all parts of the world. Dozens of constructional articles for making useful things for the shop, garden and home. Many ideas from which you can make things to sell.

Get this magazine at your newsstand today. Read about the many cash prizes which are offered for simple experiments in photography, oddities in science, uses of old auto parts, radio experiments, recipes, formulas and others.

After reading your first issue, you'll agree with us that EVERYDAY SCIENCE AND MECHANICS is all that we claim it to be, and better.

Clip Coupon and Mail!

EVERYDAY SCIENCE AND MECHANICS
100 Park Place, New York, N. Y.
WS-932

I enclose herewith One Dollar for which you are to send me EVERYDAY SCIENCE AND MECHANICS for the next Eight Months.

Name _____

Address _____

City and State _____

(Foreign or Canadian subscriptions not accepted at this rate.)

SPECIAL OFFER!

The regular yearly subscription price to EVERYDAY SCIENCE AND MECHANICS is $2.50, newsstand rate $3.00. For a limited time only we offer you **8 Months for $1.00**

6 NEW TITLES In The Science Fiction Series Are NOW Ready!

THE increasing demand by our readers for new titles to be added to the SCIENCE FICTION SERIES has now been met. Six new books have been published and are now ready. Many new authors have contributed excellent stories which you will enjoy reading. A short summary of the new titles will be found below.

These new books, as usual, are printed on a good grade of paper, and contain brand new stories never published before in any magazine.

Each book (size 6 x 8 inches) contains one or two stories by a well-known science fiction author.

THE NEW BOOKS

13—MEN FROM THE METEOR
by Panzie D. Black

In the unexplored heart of Australia lay the bizarre and cruel civilization of the meteormen. And into their midst came the two men from Outside, to pit their puny strength against the meteormen's power.

15—THE INVADING ASTEROID
by Manly Wade Wellman

Into the vision of the Earth swam the huge but innocent asteroid. Mars, at death grips with the Earth, was far away; but the asteroid loomed ominous, menacing. Two men were delegated to solve the mystery; and what they found is revealed in this startling story.

17—THE SPECTRE BULLET
by Thomas Mack
and
THE AVENGING NOTE
by Alfred Sprissler

are two surprises for the lovers of scientific detective mysteries. Death strikes suddenly in these stories; clever scientific minds and cleverer detectives are pitted against each other in a duel with Death.

14—THE FLIGHT OF THE AEROFIX
by Maurice Renard

Renard is the H. G. Wells of France. With sly humor and yet grim reality he describes the most unusual and startling flight made by man. An entirely new type of transportation dawns upon the world in this masterly story!

16—IMMORTALS OF MERCURY
by Clark Ashton Smith

Under the sun-parched surface of Mercury, we follow in this story, the experiences of a man, reminiscent of Dante's Inferno. Every force of grotesque nature, the bitter enmity of the Immortals track him down in his wild escape to the surface.

18—THE SHIP FROM NOWHERE
by Sidney Patzer

A trip to infinity is this unusual story; a mad chase across the infinite emptiness, tracked always by the avenging Marauder. Here is a story that deals with millions of years and billions of billions of miles.

MAIL COUPON TODAY FOR YOUR BOOKS!

STELLAR PUBLISHING CORP.
86-98 Park Place, New York, N. Y.

GENTLEMEN: I am enclosing herewith $.....for which you are to send me, postage prepaid, the books I have circled below. The price of each book is Ten Cents; the entire series of Six Books may be purchased for 50c. Send remittance in check, stamps or money order. The book numbers are:

13 14 15 16 17 18

Name .....

Address .....

City and State .....

WS-483

If you want to acquire any of the titles published previously, to complete your series of these Science Fiction books, you can now buy them at new low prices. Full details about our amazing offer will be found on the inside front cover of this issue.

SPECIAL OFFER

6 Books for 50c

Individual books in this NEW SERIES are sold at the price of 10c each. Not less than 3 books are sold

"PSYCHIANA"

(The Religion of Power)

A new and revolutionary religious teaching based entirely on the misunderstood sayings of the Galilean Carpenter, and designed to show how to find and use the same identical power that He used.

DR. FRANK B. ROBINSON
Founder of "Psychiana" and author of "The God Nobody Knows," "America Awakening," etc.

"PSYCHIANA"

Believes And Teaches As Follows:

FIRST—That there is no such thing as a "subconscious mind."
SECOND—That there is, in this universe, a FAR MORE POTENT and DYNAMIC POWER, the manifestations of which have been erroneously credited to some other supposed power called the "subconscious mind."
THIRD—That this INVISIBLE, DYNAMIC Power is THE VERY SAME POWER that JESUS USED when He staggered the nations by His so-called "miracles," and by raising the dead.
FOURTH—That Jesus had NO MONOPOLY on this Power.
FIFTH—That it is possible for EVERY NORMAL human being understanding spiritual law as He understood it, TO DUPLICATE EVERY WORK THAT THIS CARPENTER OF GALILEE EVER DID. When He said "the things that I do shall YE DO ALSO"—He meant EXACTLY WHAT HE SAID.
SIXTH—That this dynamic Power is NOT TO BE FOUND "within," but has its source in a far different direction.
SEVENTH—THAT THE WORDS OF THIS GALILEAN CARPENTER WENT A THOUSAND MILES OVER THE HEADS OF HIS HEARERS 2,000 YEARS AGO, AND ARE STILL A THOUSAND MILES OVER THE HEADS OF THOSE WHO PROFESS TO FOLLOW HIM TODAY.
EIGHTH—That this same MIGHTY, INVISIBLE, PULSATING, THROBBING POWER can be used by anyone—AT ANY HOUR OF THE DAY OR NIGHT and without such methods as "going into the silence" or "gazing at bright objects," etc.
NINTH—That when once understood and correctly used, this mighty Power is ABUNDANTLY ABLE, AND NEVER FAILS TO GIVE HEALTH, HAPPINESS, and OVERWHELMING SUCCESS in whatever proper line it may be desired.

DR. FRANK B. ROBINSON

considered by many to be one of the keenest psychological minds this country has ever produced, and one of the most earnest intense searchers into the spiritual realm, believes, after years of experimentation and research, that there is in this world today, an UNSEEN power or force, so dynamic in itself, that all other powers or forces FADE INTO INSIGNIFICANCE BESIDE IT. He believes that this power or force is THE VERY SAME POWER THAT JESUS USED. He believes further that the entire world, including the present church structure, MISSED IN ITS ENTIRETY the message that He came to bring. He believes that

The world is on the verge of the most stupendous spiritual upheaval it has ever experienced—the advent of Christ being of small importance when compared to it.

FREE -:- FREE -:- FREE

Every reader of this magazine is cordially invited to write "PSYCHIANA" for more details of this revolutionary teaching which, if true, might very easily be discussed the ENTIRE WORLD ROUND. Dr. Robinson will tell you something of his years of search for the truth as he KNEW it must exist, and will give you a few facts connected with the founding of "PSYCHIANA." NO OBLIGATIONS WHATSOEVER. Sign your name and address here.

NOTICE

Requests for this course of instruction and information concerning it have broken all records. Replies have come to us literally by the thousands from more than 74 different countries and students have enrolled for the course by the hundreds. "Psychiana" expected that the truths of its teaching would be recognized at once, but did not anticipate the overwhelming number of inquiries received to date. We are rapidly expanding our facilities and Dr. Robinson hopes to personally reply to all letters. Please print name and address plainly on the coupon.

WS-8

Name .....

Street and Number .....

City .....

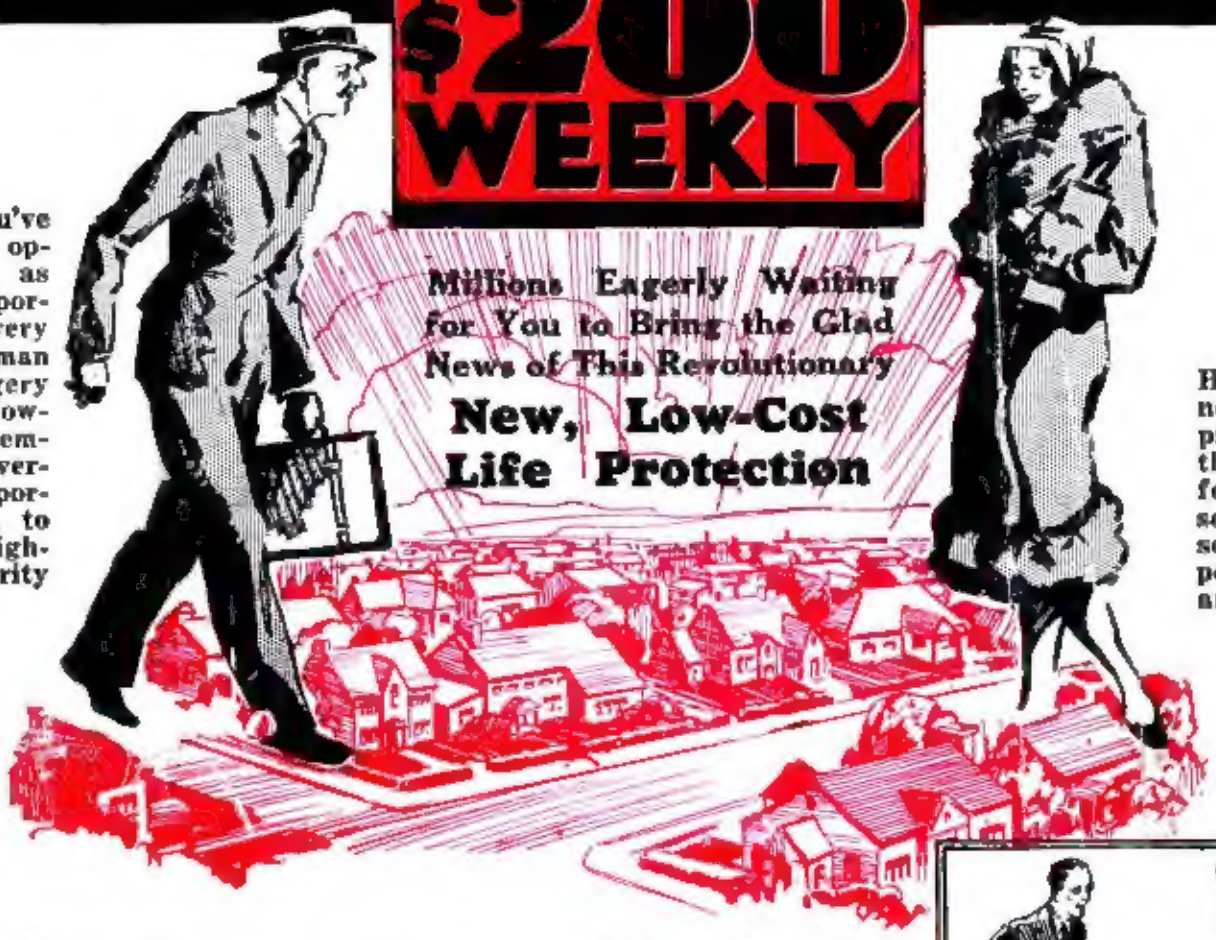
State .....

Send this to "Psychiana," Moscow, Idaho.

Men! Women!

How would you like to MAKE up to $200 WEEKLY!

All your life you've longed for an opportunity such as this. It's an opportunity for every man and woman in the drudgery and routine of low-pay jobs, unemployment, or overwork — an opportunity for you to travel the highway of Prosperity and Success!



Here is an absolutely new form of safe, sure protection, unlike anything ever before offered. It's so unusual, so exceedingly liberal, so far-reaching that people are simply amazed.

$5 Profit From Every $6 Order

UP TO $25—$40 DAILY, EASY

Aside from the interesting and enjoyable personal contacts of the humanitarian endeavor of the National Aid Society, the wonderful thing about it is the steady, every-pyramiding income that awaits you. A lavish cash-in-advance profit literally beckons to you from every door—actually $5.00 profit on every $6.00 order!

You do not spend a penny for your selling equipment which you can easily carry in your pocket. It's furnished you entirely FREE. Think of it—write just one $6 order and pocket a Five Dollar profit for it then and there! No waiting for deliveries, no future collections, no C.O.D.'s to be returned. When the deal's closed, it means Cash on the Spot, and it's yours to keep!

A NEW ADVANCED FORM OF PROTECTION

The NATIONAL AID SOCIETY is organized under the laws of Indiana, not for profit, and chartered by the Secretary of that state. Its purpose is to provide protection for all who otherwise could not elsewhere secure such protection excepting only at prohibitive costs. National Aid is NOT an Insurance Company, but, through its liberal cooperative, profit-sharing plan, offers Safe, Sure, LIFE AND PROPERTY PROTECTION MERELY AT COST. Tremendous growth has been accorded this Society ever since its inception, and particularly during the past six months.

AN AMAZING OPPORTUNITY FOR YOU

Your Field Unlimited—

Practically Every Living Person Is Your Prospect!

No Medical Examination! Practically No Age Limits! Because this extremely liberal policy, nearly every living person is a prospective member of NATIONAL AID. You can sell two members to any one person, thereby Doubling these benefits—and double your profits as well.

THIS COUPON BRINGS YOUR FREE STARTING OUTFIT

Begin Making Money Same Hour You Hear from Us!

You can turn this opportunity into Money in your pocket without spending a penny. Learn how our revolutionary new Profit Sharing Plan actually works. Mail the Coupon Now and we'll send you, ENTIRELY FREE AND WITHOUT ANY OBLIGATION WHATSOEVER, everything you need to start. Within ten minute after opening our letter you can step out of your door, call on your neighbors, and START COLLECTING FIVE DOLLAR BILLS!

So, don't delay, when your time is so valued. Write your address, and mail coupon NOW.

NATIONAL AID SOCIETY

DEPT. 692 **SPRINGFIELD, ILLINOIS**

MAKE 4 AND 5 SALES AT EVERY CALL

The National Aid Society Plan is original and exclusive. It appeals to every member of every family!—from babe in arms to gray old grandfathers and grandmothers. When you sell one, you sell them all, and the good news spreads from neighbor to neighbor. Often you earn as much in an hour as many people earn in a week of hard labor. $10 to $25 is not the limit of your daily earnings. You can often actually pocket that much at a single call!

RUSH THIS COUPON TODAY!

NATIONAL AID SOCIETY,
Dept. 692 Springfield, Illinois.

Rush me Free Complete Starting Outfit, full details of your Profit-Sharing Plan and Big Money Making proposition.

Name .....

Address .....

City ..... State .....